

C-57.117:111

International  
Marketing Information  
Series



## A Survey of U.S. Business Opportunities



# IRAN

Country Market  
Sectoral Survey

# International Marketing Information Series

This report is one of a series of Bureau of International Commerce publications focusing on foreign market opportunities for U.S. suppliers. The series is made available by the Bureau's Office of International Marketing in cooperation with the U.S. Foreign Service-Department of State. Most reports are based on research conducted by overseas contractors under U.S. Foreign Service supervision or by economic and commercial officers of the Foreign Service or Department of Commerce.

Some of the data in this series is reproduced in its original unevaluated form and the distribution of this document does not necessarily imply the concurrence of the Department of Commerce in the opinions or conclusions contained therein.

As part of its marketing information program, OIM makes available to the U.S. business community, on a continuing basis, eight types of publications and reports.

1. *Global Market Surveys*: In-depth reports covering 20-30 of the best foreign markets for a single U.S. industry or a group of related industries.
2. *Country Market Sectoral Surveys*: In-depth reports covering the most promising U.S. export opportunities in a single foreign country. About 15 leading industrial sectors are usually included.
3. *Producer Goods Research*: In-depth reports covering the best foreign sales opportunities for a single U.S. producer goods industry, or group of industries.
4. *Consumer Goods Research*: In-depth reports covering the best foreign sales opportunities for a single U.S. consumer goods industry, or group of industries.
5. *International Marketing Newsmemo*: Information bulletins received directly from the U.S. Foreign Service; reports prepared by U.S. businessmen or Department of Commerce officers; and usually distributed unedited. They cover a wide variety of industries, products, and countries.
6. *Overseas Business Reports*: Reports that include current and detailed marketing information on all of our leading trading partners. Most are revised annually.
7. *Foreign Economic Trend Reports*: Annual or semiannual reports prepared by the U.S. Foreign Service that cover, individually, almost every country in the world.
8. *International Marketing Events*: Brief market summaries in support of trade promotion events organized by the Office of International Marketing. Also, detailed calendars of upcoming events.

To supplement and up-date the marketing information available in this series, and for specific ordering information, we suggest that you telephone the nearest Department of Commerce District Office or the Country Marketing Manager responsible for the area or areas in which you are interested. A directory of these key people and offices is printed on the back cover.



Country Market Sectoral Survey

# IRAN

## A Survey of U.S. Business Opportunities



U.S. DEPARTMENT OF COMMERCE  
Domestic and International Business Administration  
Bureau of International Commerce

October 1977





# Table of Contents

	<i>Page</i>
Preface -----	iv
Basic Facts on Iran -----	vi
Iran: An Overview for U. S. Business -----	ix
Introduction -----	1
Survey Highlights -----	1
Economic Setting -----	8
Agro-Industry -----	16
Chemical Industries -----	42
Communications -----	56
Construction and Public Works -----	68
Education and Training Services -----	85
Electric Power -----	105
Food Processing and Packaging -----	118
Forest Resources Production -----	132
Government, Business and Financial Establishments (Market for business equipment and systems) -----	146
Medical and Health Services -----	161
Metallurgical and Metalworking Industries -----	174
Mining, Petroleum and Natural Gas -----	195
Printing and Publishing -----	221
Textiles and Apparel Manufacturing -----	233
Transportation -----	248
U. S. Government Services -----	282
Appendix 1: Marketing and Import Procedures -----	289
Appendix 2. Addresses of Iranian Government Ministries -----	296

# Preface

This is a survey of major Iranian economic sectors to identify business opportunities for U.S. firms. The *Overview* assesses Iranian development prospects and highlights survey findings. The individual chapters describe sector structure and dynamics; identify key government organizations; discuss major development objectives, trends, programs, and projects; identify principal requirements for capital goods, technology, and services; evaluate the competitive environment in which U.S. firms must operate; and outline important marketing considerations.

The survey is based on research performed in Iran by Marketing Research Associates of Tehran, under contract to the U.S. Department of Commerce. Field work was conducted from September 1976 through April 1977. The survey method emphasized extensive interviews with Iranian businessmen and government officials to verify and update information from secondary sources and official statistics. The survey was conducted under the direction of Sectoral Survey Program Manager Joseph A. Whelan and Field Project Manager Franklin J. Kline of the U.S. Department of Commerce. Support and assistance was provided by officers of the U.S. Foreign Service, Department of State assigned in Iran.

Official trade and economic statistics and Iran's Fifth National Development Plan (1973/74-1977/78) were major sources of the data and projections in the survey. It should be noted that Iran's five year plan is indicative and not directive. Although it establishes spending level objectives for both the public and private sectors, private sector spending levels are of course responsive to many other market variables.

Official Iranian statistics are reported in accordance with the Iranian Monarchic Calendar in which the year runs from March 21 through March 20. The Iranian years are identified by the Gregorian calendar years with which they overlap where the distinction was felt necessary, i.e. the Iranian year 2536, beginning March 21, 1977 is shown as 1977/78; where the distinction was felt to be less important it may simply be shown as 1977. Trade data, however, are based on Gregorian calendar years, since they reflect not only an evaluation of official Iranian figures, but also of supplier country trade statistics. All data for 1976 and future years are estimates and projections unless otherwise indicated. Figures in the report frequently represent estimates and projections adjusted from official sources by the contractor, based on extensive trade interviews.

Dollar values in the report are converted from Iranian Rials at current prices as follows: 1970-72, U.S. \$1.00=Rials 75.75; 1973, U.S. \$1.00=Rials 69.30; 1974, U.S. \$1.00=Rials 67.62; 1975, U.S. \$1.00=Rials 67.64; 1976, U.S. \$1.00=Rials 70.50. Projections for 1980 are made at 1976 prices. The official units of measure in Iran are the metric system, all weights and measures in this report, including tons, are metric unless otherwise indicated.

This survey is one of a series of in-depth reports on business opportunities in countries which are important U.S. trading partners. Countries are selected because of dynamic developments in their economies and a high level of interest by the U.S. business community; or because of significant changes in their trade relations with the United States. Surveys completed to date include Brazil, Nigeria, Venezuela and Indonesia. Surveys either in progress or planned include Japan,

Brazil (update), Korea, and Spain. The Department of Commerce welcomes comments on the usefulness of this survey and suggestions that will make future reports more responsive to the needs of U.S. business. Send comments to: Director, Market Research Division (DIBA), U.S. Department of Commerce, Washington, D.C. 20230.

# Basic Facts on Iran

## Resources

**Land.**—Area, 636,000 square miles lying between the Caspian Sea in North and Persian Gulf and Gulf of Oman in South. Borders with U.S.S.R. (North) Turkey and Iraq (West) Afghanistan and Pakistan (East). Topography consists primarily of interior desert plains and highlands (3,000–5,000 feet high) surrounded by rugged mountainous rimland cut by deep valleys and gorges. Mountains cover 50% of total land area. Most important mountain ranges are Zagros, running in a southwest direction along entire western part of the country, and Alborz, which runs East-West across northern quadrant. Lowland areas limited to narrow belts along Caspian and Gulf coasts. Central plateau is partially covered by large uninhabited swamp, sand and desert areas. Agricultural and inhabited zones are concentrated on about 30% of land.

**Climate.**—Characterized by wide ranges in precipitation and temperatures. Sub-tropical Caspian Coast receives an annual average of 50 inches of precipitation as do the Western Mountains, while some regions in arid central desert receive less than 2 inches. Heaviest concentrations of moisture are from December to March. Temperatures range from  $-8^{\circ}\text{C}$  ( $18^{\circ}\text{F}$ ) in mountainous northwest to  $56^{\circ}\text{C}$  ( $132^{\circ}\text{F}$ ) in parts of desert. Winter lasts up to 6 months in northwest, while Tehran has a moderate winter and usually receives snow only during January-February. Preferred times for visiting Iran are spring and fall, when ordinary European summer clothing with a light overcoat for evening wear is suitable.

**Minerals.**—Major minerals produced: petroleum, natural gas, copper, iron, coal, lead, zinc. Much of country has been geologically unexplored and major mineral resource surveys were underway in the mid-1970's.

## People

**Population.**—35.2 million (1976) estimate. Annual growth rate about 3.1%. About two-thirds of populace are Aryan peoples of Central Asian origin. In addition to

the Persians, who are settled urban dwellers and farmers, this includes Kurd, Lur, Bakhtiari, and Balouchi tribal groups. Remaining third consists of people of Turkic origin and about 500,000 Semitic Arabs. Population distribution about 51% male, 49% female; about 45% between 15 and 64 years of age, and 3% 64 and above. About 45% of population urban dwellers. Major cities (1976: Tehran (4.4 million), Esfahan (800,000), Mashhad (600,000), Tabriz (550,000), Abadan/Khorramshahr (440,000), Shiraz (370,000). Workforce about 10 million, of which about 14% were women. Distribution of work force (1975) agriculture (37%), industry (32%), services (31%).

**Language.**—Official language is Farsi (Persian), an Indo-European language, written in Arabic script. Minority languages and dialects include Armenian, Kurdish, Turkins, Arabic, and Assyrian. English and French widely spoken among educated classes.

**Religion.**—Official religion of Iran is *Shiah* branch of Islam. Religious minorities include some 250,000 Christians (Primarily Armenian Orthodox and Assyrians), 80,000 Jews and 35,000 Zoroastrians (followers of Persia's Pre-Islamic, mono-theistic religion).

**Education.**—The total student population in 1975/76 was about 7.6 million, 4.2 million were in kindergarten and elementary schools, 3.2 million in middle, high, and vocational school, and some 200,000 in teachers training and higher educational institutions. Estimated literacy rate for population 10 years and over, 41%.

## Political Factors

**Government.**—Iran is a constitutional, hereditary monarchy. Under 1906 Constitution highest political authority is vested in the Shah. Bicameral Parliament consists of elected lower house, called majlis, and partially elective Senate. Prime Minister and cabinet appointed by monarch with parliamentary approval. Administrative and judicial systems are based on French model. In 1976 Iran was divided into 22 administrative regions designated as "Provinces" (ostans) and "governnates", and headed



respectively by royally appointed governors-general and governors.

**International.**—Northern border with Russia has been a traditional Iranian security concern. Iran has maintained close relations with United States and Western Europe since World War II. Iran joined Baghdad Pact (now Central Treaty Organization—CENTO) in 1955. The United States and Iran signed a defense agreement in 1975. Iran has assumed a growing regional leadership role and has also extended economic assistance to a number of developing countries. Along with Turkey and Pakistan, Iran formed the Regional Cooperation for Development (RCD) to coordinate regional communications, trade and industrial development. Iran was leading force in formation in 1960 of the Organization of Petroleum of Exporting Countries (OPEC). Iran is member of United Nations and its affiliated agencies, the International Monetary Fund, The World Bank Group, and the International Atomic Energy Agency.

### *Economy and Finance*

**Currency.**—Iranian currency unit is the Rial (R1). A strong and readily convertible currency for many years, exchange rate leveled out at R1s 70.50=U.S. \$1.00 following a series of mini-devaluations in early 1976. This rate still in effect mid-1977. There are no foreign exchange controls or restrictions on foreign currency deposits in domestic banks.

**GNP.**—70 billion (at current prices) for 1976/77 (Iranian year 2535 ending March 20, 1977); per capita GNP \$2,000. Real growth about 15%; while not equal to spectacular growth during boom years 1973 (34%) and 1974 (42%), is comparable to level of sustained growth experienced during 1964–72. Latest available figures showed 1975/76 contribution to GNP of industry, mining and construction were 18%, and of services 16%. Government projects GNP of \$79.3 billion in 1977/78.

**Development Plan.**—Fifth National Development Plan, running from March 21, 1973 through March 20, 1978, calls for total fixed capital investment by both public and private sectors of \$69.6 billion, revised upward in 1974 from \$36.4 billion in view of increased petroleum revenues. High levels of investment were planned for

housing (\$13.7 billion), industry (\$11.6 billion), petroleum (\$9.24 billion), transport and communication (\$7.3 billion), agriculture (\$4.6 billion) and electric power (also \$4.6 billion). Projected annual growth rate of economy (GNP) was 26%.

**Budget.**—Total estimated 1977/78 budget is \$49 billion, including expenditures and revenues of self-supporting state enterprises and other agencies, up 9.9% from \$44.7 billion in 1976/77. Anticipated receipts for the Government's \$33.4 billion general operating budget were placed at \$31 billion, of which the largest contributors, oil and gas, are to account for 63% or \$19.5 billion. While percentage of revenues from petroleum industry scaled down 10% from previous years, anticipated tax revenues were increased by 34% over previous years to \$5.8 billion or 18.9% of total. Foreign borrowing at \$1.4 billion up slightly from previous year.

**Balance of Payments.**—Data for Iranian year 2535 (ending March 20, 1977) indicated balance of payments surplus of \$4.3 billion for current account, and an overall balance surplus of \$2 billion. Major factors influencing the balance of payments position were oil exports, down relative to the previous year, as well as imports and long-term capital borrowing, both growing moderately. Foreign exchange reserves were \$9.4 billion at year's end.

**Foreign Trade.**—Total non-military imports amounted to \$12 billion in 1976, with military equipment adding another estimated \$5 billion to import bill. Import growth slowed to 24% in 1976 after 3 years of rapid increases. 42% in 1973 to \$3.7 billion, 62% in 1974 to \$6.6 billion, and 86% in 1975 to \$11.8 billion. Iran's non-military imports from U.S. were \$2.15 billion, representing 16.9% market share. Other major suppliers, West Germany (18.1%), Japan (16.3%), U.K. (7.7%), U.S.S.R. (1%). Five major commodities representing over 70% of total import value were: Machinery and parts, iron and steel products, vehicles and components, foodstuffs, and electric machinery and parts. Iran's merchandise exports (excluding oil but including gas) amounted to \$736.5 million, an increase of 4.1% over 1975. Major exports: cotton, fruits, carpets, ores and hides. Manufactured goods including vehicles, knitted goods, soap and laundry preparations, shoes and aluminum metal, accounted for 18 to 20% of total exports. Major Iranian customers, U.S.S.R. (25.5% including majority of gas), West Germany, U.S., Japan, and Italy.







# Iran: An Overview For U.S. Business





# Introduction

IRAN, WHOSE name means "Land of the Aryans", has national roots going back over 2,500 years when the Persian Empire under Kings Cyrus, Darius, and Xerxes extended from the Nile to the Indus rivers. Iran has been a crossroads for trade and culture in the Middle East. During Iran's long history it has periodically been dominated by Greek, Arab, Turkish, and Mongol forces, but it has always maintained its national identity. Modern history began with the establishment of Tehran by the Qajar-Shahs in 1795. Iran never became a European colony, although during the 19th and early 20th centuries the British and Russians competed for influence.

Nationalist reformers, whose pressure for representative government resulted in the Constitution of 1906, overthrew the Qajar Dynasty in 1925, and installed the popular General Reza Khan as Shah. Adopting as his dynastic name the symbolic old Persian "Pahlavi", Reza Shah instituted a program of progressive modernization which has been carried forward by his son, Shah Mohammed Reza Pahlavi, who succeeded him in 1941.

Iran was occupied by Soviet and British forces during World War II, ostensibly only for the duration of the war. Soviet-backed regimes were established in the areas under their control, and U.S.S.R. military forces were withdrawn only after Iranian pressure was supported by the United States and Britain. The collapse of the pro-Soviet governments and the occupation of the rebel areas by the Iranian Armed Forces followed in late 1946.

The 1950's were a period of political crisis. The turning points were the nationalization of the British-controlled oil industry in 1951, and an unsuccessful challenge to the authority of the Shah by

the then Premier Mohammad Mossadegh in 1953.

In 1961 the Shah instituted a series of reforms he had long favored, over the opposition of landowners, traditionalist clergymen, and other conservative elements. Known as the "White Revolution", the program includes land reform and agricultural modernization, universal suffrage, industrial development with profitsharing, public ownership of state enterprises, nationalization and conservation of natural resources, mass education and literacy, as well as improved public health and government administrative reform.

The period beginning in the mid-1960's has been one of stability and progress in Iran. A series of ambitious 5 year development plans began to bear fruit and the economy achieved a real growth rate of 11% per annum during the 1965-72 period. In 1971-72 Iran celebrated the 25th Centenary Celebrations of the Iranian Monarchy at the ancient capital of Persepolis, symbolizing the continuity between past and present. The year 1973 was a key year in Iran's petroleum industry, the revenues from which have been the principal source of funds for national development. First, Iran signed new agreements with the foreign oil companies which operated the oil fields. In essence this completed the process of establishing national control over this vital resource. Second, Iran took a leading position within the Organization of Petroleum Exporting Countries (OPEC) in bringing about a rise in crude oil prices which substantially altered the terms of trade between Iran and the other oil producers, and the industrialized countries. Iran's increased petroleum revenues have supported an extraordinary period of national development. The prospects are excellent for Iran's long term evolution into a major industrialized power.

## Survey Highlights

Iran's rapid economic growth has established a business climate characterized by expansion and keen competition, which should continue for sev-

eral years to come. United States suppliers hold a leading position in the Iranian market; they accounted for approximately 17% of Iran's total non-military imports in 1976, valued at about \$2.2 billion. While the "boom town" atmosphere created by

<sup>1</sup> This overview was prepared with the assistance of Albert E. Fairchild, U.S. Trade Center, Tehran, Iran, and Michel F. Smith, Country Specialist for Iran, U.S. Department of Commerce.

**Table 1.—Iran: Capital Goods Market, by Sector**  
(in millions of U.S. dollars)

Sector	Total Market			Imports			U.S. Sales	
	1975	1980	Growth Rate %/yr.	1975	1980	Growth Rate %/yr.	1975	Share %
Transportation .....	1,866.3	2,928.2	9.4	1,681.6	2,243.4	5.9	630.2	37.5
Road .....	1,229.4	2,110.0	11.4	1,046.2	1,445.8	6.7	290.4	27.8
Air .....	449.7	605.5	4.2	449.7	590.5	15.1	318.7	58.5
Marine .....	125.8	157.8	4.6	124.4	153.2	4.3	6.9	5.5
Rail .....	61.4	54.9	-2.2	61.3	53.9	-2.5	14.2	23.2
Construction and Public Works ..	2,199.0	4,767.0	16.7	1,304.4	2,224.1	11.3	352.2	27.0
Building Materials .....	1,560.7	3,741.0	19.1	672.0	1,057.0	9.5	132.6	19.7
Equipment .....	638.3	1,026.0	9.9	632.4	1,167.1	13.0	219.6	34.7
Mining, Petroleum and Natural Gas	641.0	1,117.0	11.7	610.5	1,018.4	10.8	133.7	21.9
Petroleum and Natural Gas .....	416.4	920.7	17.2	386.1	823.7	16.4	102.4	26.5
Mining .....	224.6	196.3	-2.6	224.4	194.7	-2.8	31.3	13.9
Electric Power .....	337.2	2,069.7	43.7	324.9	2,036.0	44.3	60.5	18.6
Communications .....	334.5	558.0	7.8	223.6	312.9	6.0	61.8	26.5
Metallurgical and Metalworking								
Industries .....	263.9	650.0	19.7	197.8	484.0	19.6	43.8	22.1
Metallurgical Industry .....	100.2	266.0	21.6	86.9	266.0	25.1	25.4	29.2
Metalworking Industry .....	163.7	354.0	16.7	110.9	218.0	14.5	18.4	16.6
Textiles and Apparel Manufacture.	211.6	270.5	5.0	211.6	270.5	-4.8	4.2	2.0
Agro-industry .....	173.1	310.4	12.4	82.1	126.3	9.0	13.5	16.4
Food Processing and Packaging ...	101.7	199.3	14.4	94.7	183.6	14.2	15.2	16.1
Government, Business and Financial								
Establishments <sup>1</sup> .....	96.2	182.2	13.6	91.0	166.0	12.8	31.4	34.5
Chemical Industries .....	75.9	177.8	18.6	75.7	172.9	18.0	16.3	17.0
Medical and Health Care .....	44.4	89.8	15.1	44.4	89.8	15.1	10.3	23.2
Forest Resources Production .....	57.4	56.0	- .5	56.7	50.0	-2.4	18.5	32.6
Wood harvesting and Processing ..	45.3	38.5	-3.2	44.6	32.5	-6.1	17.0	38.1
Pulp and Paper Production .....	12.1	17.5	7.7	12.1	17.5	7.7	1.4	11.6
Printing and Publishing .....	18.5	22.9	3.4	18.5	22.9	4.4	2.1	11.4
Education and Training Services ..	29.3	83.7	23.4	12.2	38.5	25.8	1.5	12.3
<b>TOTAL .....</b>	<b>6,450.0</b>	<b>13,482.0</b>	<b>15.9</b>	<b>5,039.7</b>	<b>9,439.3</b>	<b>13.4</b>	<b>1,395.2</b>	<b>27.7</b>

<sup>1</sup> Purchases of Business Equipment and Systems.

Source: U.S. Department of Commerce market research survey.

the massive influx of oil revenues following the 1973 oil price increases by the Organization of Petroleum Exporting Countries (OPEC) has subsidized, excellent opportunities continue for sales of U.S. capital goods and services to Iran. The size of Iran's economy grew nearly 169% from a Gross National Product (GNP) of \$26 billion in 1973/74 to an estimated \$70 billion in 1976/77. The growth rate of Iran's economy appeared to be levelling out as of mid-1977 to a rate which could be realistically sustained over the longer term. Progress in implementing national development plans had, by the beginning of 1977, laid the base for a sound industrial, economic, and social infrastructure.

## RESEARCH FINDINGS

Purchases of capital equipment in the 15 sectors included in this survey are expected to grow at an average annual rate of about 16% during the 1975-80 period, rising from \$6.4 billion to over \$13 billion (see table 1). Although the capabilities of Iranian domestic industry are expected to increase during the period, imports will still supply the majority of Iran's capital equipment requirements

(about 69%) in 1980, when they are expected to total about \$9.4 billion. Equipment sales to the 15 sectors by U.S. suppliers in 1975 were \$1.4 billion, representing nearly 28% of such imports. While there are significant market opportunities in all sectors, a number of sectors are particularly outstanding because of the magnitude of the market, because of a high rate of projected market growth, or because U.S. suppliers have particular competitive advantages pointing to a continuing large market share.

**Construction and Public Works.**—Continued high levels of investment in infrastructure, industrial plant, and housing are expected to sustain a high level of growth in construction activity during the 1975-80 period. Capital investment for both government and private construction is expected to reach \$23.5 billion in 1980, while value of new construction put in place in 1980 is expected to total \$11.6 billion. The increased number of high rise buildings, commercial, housing, and industrial complexes to be constructed, coupled with shortages of skilled workers and increasing labor costs, will have a marked effect on the industry. They are expected to result in growing investment by industry in new equipment, materials, and technology to speed up construction time and cut labor costs. Purchases of new equipment by the industry in 1980 are expected to total about \$1 billion.

**Transportation.**—Increased attention has been focused on the transportation system to improve its capacity to



handle the massive increases in goods required to carry out Iran's ambitious development plans. A total of about \$7.3 billion was allocated for investment during the Fifth National Development Plan. A number of major transportation projects are in various stages of planning and implementation. Many projects initiated during the Fifth Plan period will extend into the Sixth Plan period beginning in March 1978. Total sales of transportation equipment including vehicles, parts, maintenance, and other ancillary equipment were valued at \$1.87 billion in 1975, and are projected to reach over \$2.9 billion by 1980.

Major road transport projects include construction and upgrading of highways, expansion of trucking fleets, and development of warehousing and maintenance facilities. While the major automobile manufacturers are well established in the assembly industry, there will be continued opportunities for sales of parts and components as well as trucks, tractors and trailers, specialized vehicles and automotive maintenance equipment. Marine transport projects include port construction and expansion and procurement of vessels. Equipment requirements include fixed and mobile cranes, specialized bulk cargo handling equipment, and dockside equipment such as fork lift trucks and container handlers. In addition to oceangoing general cargo and petroleum tankers, various specialized ships and boats will be bought.

Plans for the air transport system include a number of airport construction and expansion projects. A new international airport is being constructed in Tehran. The first phase cost is estimated at about \$800 million. Implementation of a proposal by the U.S. Federal Aviation Administration for the upgrading of the Iranian air traffic control system could result in expenditures of as much as \$250 million for avionics, telecommunications, and other equipment and services over a period of several years beginning in 1978. The Iranian National Railways Corporation has embarked on the initial stages of a 20-year expansion plan which includes construction of new lines, double-tracking and electrification of existing lines, and acquisition of new rolling stock.

**Communications.**—Capital investment in communications by civilian Iranian government and private agencies is expected to average over \$500 million annually during the 1975–80 period. Major projects either in the implementation or planning stages include telephone service expansion, telex switching stations, post office expansion and automation, gas pipeline microwave communications systems, and a domestic telecommunications satellite system. Telecommunications equipment purchases in 1975 totalled \$334.5 million, including consumer electronics valued at about \$83 million. The expansion of the telecommunications system will spur sales of all types of subscriber equipment, while the planned domestic satellite system will require extensive associated equipment and services. Components, production, and test equipment will also be needed by the growing domestic electronics industry. Total sales of communications equipment are projected at about \$559 million in 1980.

**Metallurgical and Metalworking Industries.**—Iran's metallurgical and metalworking industries are among the fastest growing industrial sectors. Total expenditures for basic metals production equipment, machine tools, and other metalworking equipment are projected to grow at an average annual rate of nearly 20%, from \$264 million in 1975 to \$650 million in 1980. The Government is investing heavily in the primary metals industry. The objective is increasing production to 10 million tons of steel, 150,000 tons of aluminum, and nearly 150,000 tons

of copper by 1980. Capital expenditures in primary metals production are expected to reach \$860 million in 1980, over three times the 1975 level. Most projects are employing advanced technology. Facilities at the state-owned Sarcheshmeh Copper Mine in Kerman Province are designed to ultimately handle the complete processing of ore from extraction through refining of copper metal. A complex of subsidiary plants to produce a wide range of copper products such as cable, sheet, tubing, and other items is to be developed at Sarcheshmeh, primarily by the private sector. Five new steel plants are either under construction or in the planning stage. These plants will employ the direct reduction process using natural gas to produce sponge iron for further processing into steel and continuous casting into basic steel shapes.

Metal products fabrication including vehicles, consumer durables, structural metals, and industrial machinery manufacturing is also expected to develop rapidly. Value added of production by the metal products fabrication industry is expected to grow at an average annual rate of 22%, from about \$2 billion in 1975 to nearly \$5.6 billion in 1980. The limited supply of skilled labor and growing demand for metal products is causing Iranian manufacturers to seek increased productivity through use of numerically controlled, automatic, and high capacity machine tools and equipment. Purchases of metalworking equipment are expected to reach \$266 million in 1980. Domestic manufacturers will also continue looking to foreign sources to license designs for consumer durables, machine tools, automotive components, and other products.

**Agro-industry.**—Increasing agricultural productivity through mechanization and large scale agro-industry has been identified as a critical area of the national development effort. The Government has channeled substantial credits into private sector agricultural development, encouraged foreign investment in the form of large agribusiness projects to bring new land under cultivation, and fostered the formation of jointly owned agricultural corporations by small-holders and herdsmen. Sales of agricultural equipment in 1975 totalled \$173 million. The market is expected to grow at an average annual rate of about 12% per annum through 1980. Substantial investments are planned in agricultural mechanization and in capital intensive dairy and poultry farm operations. In addition to poultry and dairy equipment, other equipment with good sales prospects include harvesters, mowing machines, land preparation and cultivation equipment, trailers, and grain handling equipment. An increase in land under irrigation will produce opportunities for sales of irrigation systems. There will also be a growing market for agricultural management services as well as specialized farm services such as development of programs for equipment maintenance, pest control, stock breeding, and accounting.

**Chemical Industries.**—The growth of the Iranian chemical industries has been rapid since the early 1970's, and petrochemical production has been earmarked for substantial investment. A number of large petrochemical projects were in the construction or planning stages in early 1977. Government plans call for Iran to become a major world source of petrochemical products, supplying over 5% of world production by 1985. Capital investment in petrochemical industry development is expected to grow at an average annual rate of nearly 17% during the 1975–80 period, reaching over \$900 million.

U.S. firms are in an excellent position to increase their sales of equipment and services in this growing industry.

U.S. manufacturers are leading equipment suppliers to the Iranian chemical industries, while U.S. process technology is widely used through joint ventures, licensing agreements, and other forms of technical cooperation. U.S. engineering firms have played an important role in the construction of Iranian petroleum refineries and petrochemical plants. The market for chemical process equipment, controls, and instrumentation is expected to grow from about \$78 million in 1975 to nearly \$180 million in 1980.

**Government, Business and Financial Establishments.**—Iran's rapid development has necessitated the adoption of more sophisticated management systems and the increased use of advanced business equipment and software in both the public and private sectors. Computer placements increased from 63 in 1970 to 268 by 1975. Total sales of business equipment grew from \$37 million in 1970 to over \$96 million in 1975, and are projected to reach \$182 million in 1980.

U.S. suppliers have established a strong position in this market based on the recognized high technological level of American products. There are excellent opportunities for new firms to enter the market, as well as for firms already active in Iran to increase their sales of computers, peripheral equipment and software, advanced accounting machinery, microfilming equipment, and other products.

**Medical and Health Care.**—Iran's Fifth National Development Plan envisioned a doubling of available medical facilities and services during the 1973/74–1977/78 period. Government budgets during the 5 year period have actually exceeded the \$3.5 billion total allocated by the plan by some \$166 million.

Sales of medical equipment are forecast to grow from \$44.4 million in 1975 to nearly \$90 million in 1980. Shortages of trained medical personnel, coupled with investment in ambitious new facilities, will stimulate purchases of labor saving equipment such as central station and bedside patient monitoring units as well as disposables. It is expected that over 70 new operating rooms will be built in Iran in the 1975–80 period, all requiring equipment of general and specialized types. New hospitals and upgraded facilities will require laboratory equipment and instruments. Ambulances, mobile emergency diagnostic and treatment equipment, and mobile clinics will be required. There will be continued opportunities for sales of specialized medical services, including hospital design and management to private medical groups, equipment service and maintenance, and some medical and paramedical training software.

**Mining, Petroleum and Natural Gas Extraction.**—The petroleum industry is Iran's principal source of revenues to underwrite the country's ambitious development plans. The Government's export earnings from petroleum and natural gas were about \$20 billion in 1976/77. Continued high levels of investment are planned during the 1975–80 period for exploration and development of new oil and natural gas reserves, for increasing recoverable reserves in older producing oil fields through introduction of secondary recovery methods, and for construction of gas, oil, and product storage and pipeline facilities. Annual capital investment by Iran's state-owned petroleum and natural gas corporations is expected to grow from \$1.2 billion in 1975 to \$1.9 billion in 1980.

Iran's mineral resources were only just beginning to be fully explored and exploited in the mid-1970's. Coal and iron reserves are under development to support the planned expansion of the domestic steel industry. The \$1.4 billion Sarcheshmeh project will include an integrated

copper mining and metallurgical complex. Iran has deposits of chromite, lead, zinc, and some manganese. These have been exported in ore form for some years. Priority has been given to establishing facilities to process these ores into concentrates, metals, and alloys. Surveys also are under way to determine exploitable reserves of bauxite, phosphates, uranium, and other ores, of which traces have been identified in various locations within the country. Annual capital investment by the mining industry is expected to grow from \$315 million to \$450 million between 1975 and 1980.

Projections indicate that 1980 sales of equipment for petroleum and natural gas extraction will reach over \$920 million, while equipment purchases by the mining industry will approach \$200 million. The petroleum and natural gas industries will have continuing needs for equipment, technical and support services. There will be substantial opportunities for sales of drilling rigs and instrumentation, specialized pumps, valves and compressors for production, secondary recovery and transportation, and of other pipeline equipment. Mining development projects will require significant quantities of geological survey and testing equipment, underground and surface mining equipment, and ore processing equipment.

The Iranian market is becoming increasingly competitive, as European and Japanese suppliers step up their marketing activities. To maintain their share of sales, U.S. firms will have to intensify their marketing efforts, develop the capability to tailor their sales package to the needs of Iranian buyers, including design, installation, startup training, and after-sales service and financing. Trade sources believe that U.S. suppliers could make greater efforts to take advantage of Iranian market opportunities. In the course of interviews conducted for this survey many Iranian business and Government decision makers cited instances where American businessmen lost important sales opportunities due to failure to follow up on genuine leads and direct inquiries. Unless U.S. firms become more competitive in the Iranian market their share of sales could continue to decline in a number of marketing sectors. Based on a projection of current market trends, while the value of their sales is expected to increase, the U.S. suppliers' share of capital equipment imports in the 15 sectors surveyed in this report could drop from the 27.7% obtained in 1975 to under 18% in 1980. On the other hand, the retention of 1975's share of projected imports in 1980 would represent additional sales of nearly \$1 billion by U.S. firms.

## MARKET ACCESS

Operating successfully in the Iranian market requires a long-term commitment, thorough homework, frequent visits to Iran or a permanent presence, patience, and persistence.

An entrée into Iran's business world with its complex web of power, personal and business relation-



ships is vital to successful marketing in Iran. Adaptability to the Iranian way of doing business is essential. Business relationships in Iran are highly personalized. While persistence is required, high pressure sales tactics are notably unsuccessful. Iranians are past masters at "one-upmanship." They like to gain the advantage over the other party by manipulating people and situations. They respect strength, while being contemptuous of weakness and foolhardiness. They prefer to negotiate a price and are generally not receptive to buying from a price list. They prefer to deal with sales representatives who have the authority to make decisions on the spot regarding financing, pricing, delivery, and servicing. Contracts should be written and drafted with the assistance of legal counsel.

Many of Iran's leading businessmen began their careers in a bazaar trading atmosphere or have shifted from being landholders to entrepreneurs as a result of land reform programs. They tend to be more entrepreneurs than managers and technicians, although many have a healthy respect for technology. They are inclined to take a rather short-term approach to business, regarding it as a series of day-to-day deals justified on the basis of immediate rewards. Business with senior government officials or business leaders may often not be conducted on a one-to-one basis, but the meeting may include other visitors conducting totally unrelated business, and involve lengthy digressions from the topic at hand. Tea is invariably served at business meetings and should at least be sipped. The implied disregard for the importance of time should not, however, obscure the fact that timely and aggressive sales efforts are still the best way to achieve results in Iran.

The importance of having a reliable and capable representative in Iran cannot be overstressed. A representative is essential to keep fully informed of new business opportunities and other shifts in the market, and to cultivate and maintain necessary personal contacts in government and in the private sector. One who has ability as well as good family and other connections in the local community is in a better position than an outsider to deal effectively with his business colleagues. A local representative can be especially valuable in dealings with the public sector, since doing business successfully with government organizations usually requires more time than a representative from the home office or a regional office could reasonably spend in the country.

Identifying a good local associate is not easy. The individual who knows his way around in Iran and can make a deal happen, performs a valuable service and commands a premium. While there is no shortage of individuals claiming such capabilities, it is essential to confirm their claims. This

requires thorough following up with conventional sources such as trade and banking references, U.S. businesses in Iran, the Embassy Commercial Section, and Chambers of Commerce. Dun & Bradstreet was in the process of developing a Tehran operation in mid-1977. However, much business information openly available in the United States and Europe continues to be regarded as confidential in Iran. In the end it will be necessary to rely on informal sources and a liberal dose of intuition in making a decision on establishing a business relationship. It is preferable to make the initial arrangements limited and clear cut, leaving open the option for expanding the ties as success develops mutual confidence.

Even the best local agent cannot be effective without the close supervision and support of his principal. An Iranian agent is likely to need guidance in developing an effective marketing program and in setting up a proper distribution network. If he is at all interested in maximum market penetration, he wants to be in a position to move quickly, with the full support of his principal whenever major sales opportunities arise. Above all, he seeks assurance that if customer complaints arise, because of defective merchandise or because of a lack of spare parts or technicians locally, he will receive help from the principal's home office promptly when he needs it. Too often an American company has succeeded in finding and training a first-rate agent, only to leave him to fend for himself. Written communications from the agent to his principal may go unanswered for long periods of time, particularly when the U.S. manufacturer has a backlog because of rapid growth in the home market or raw materials shortages. Eventually, the agent becomes dissatisfied with the lack of interest and support from the principal, and he ceases to promote the American company's product. He may sever his ties with the company as soon as he is able to line up a competitor who promises him a more fruitful relationship.

Some U.S. firms, particularly in the professional service industries, may wish to establish themselves in the Iranian market with more than a simple agent relationship. Local partnerships may offer advantages. In many large government contracts a local venture may be required. This requirement can often be fulfilled by ad hoc partnerships formed on a project-by-project basis. Agreements should be drawn up with legal advice. Hand shakes or other non-binding oral agreements should not be relied upon in Iran.

After-sales services is a critical problem in Iran. There is no easy solution. Generally speaking, American industry has built up a good reputation vis-a-vis its foreign competitors in this regard, but there have

been some long-remembered episodes which have damaged the U.S. reputation. U.S. firms which place their own technical service representatives in Iran, or at least in the region, enjoy a decided advantage over those that rely entirely on the local sales organization. Every Iranian distributor who has attempted to develop a good service capability has had a difficult time retaining competent technicians. Because of Iran's continued rapid industrial development, the shortage of technicians will continue to be severe for the next several years at least. A group of American manufacturers of related high technology equipment, and their distributors, are trying to work out a solution to the problem of after-sales service by pooling their resources to form a service consortium. If successful, this approach to solving the service problem may set a trend for the future.

The consortium approach may in fact offer advantages to many firms in overcoming the relatively high costs of maintaining adequate sales and service capabilities in Iran. Under such an arrangement, firm producing complementary lines of equipment share the costs of maintaining a marketing and service office in Iran. Such an approach has proven successful for one group of U.S. machine tool manufacturers (see Chapter on Metallurgical and Metalworking Industries), and could be effective for other groups.

In Iran personalized sales calls on prospective customers, reinforced by conscientious technical support, are the most effective keys to sales success. Direct mailing of product literature and use of various advertising media are important adjuncts to any direct sales effort.

Credit and financing became increasingly important in 1976/77 in sales to both private sector and government buyers. This is in marked contrast to 1974/75 when the massive influx in oil revenues resulted in widespread cash purchases. The Government is increasingly expecting financing on the foreign exchange costs of major projects. Since commercial credit is relatively expensive in Iran and available only in short term notes, a supplier who can offer an attractive financing package has a decided advantage over competitors.

Another issue confronting both the businessman and the Government of Iran is the custom of *baksheesh*, a gratuity paid to ensure prompt performance. Manifestations of *baksheesh* may be more irritating than criminal. Buyer's commissions, rebates in connection with substantial purchases and "finder's fees" for many business services are not uncommon. Influence peddling in the highest circles was revealed and criticized on the front pages of Iranian newspapers in 1976, although there are laws which deal harshly with those convicted of such crimes. Iran's "anti-corruption campaign" fights

against centuries of tradition. This tradition has been reinforced by the tremendous amounts of money involved in the country's post-1973 boom.

## Import Channels

In Iran no fine distinction is drawn between import merchants, agents and distributors. Most importers are general traders and an importer often handles many different lines of products. It is not unusual for one importer to simultaneously represent manufacturers of competing products. He may be a commission agent for some suppliers, while acting as an authorized distributor for others. Sometimes the same merchant may import on his own account or act as a principal on a back-to-back basis (i.e., the goods have been presold). There are relatively few large import houses with separate departments specializing in handling different groups of products. There is, however, a nascent trend toward specialization within and among firms, especially those handling specialized industrial equipment, instrumentation, medical equipment, and other relatively high technology goods.

The number of importers engaged in importing a given product line varies. There are, for instance, over 100 importers of automobile parts. On the other hand, many product lines are handled by fewer than a dozen.

There is a heavy concentration of representatives of foreign manufacturers in Tehran. It is often necessary for customers in other cities to travel to the capital in order to seek out suppliers. Few distributors employ traveling salesmen; even fewer maintain service organizations or parts inventories anywhere other than Tehran. Many agents try to handle such a wide variety of product lines that they cannot possibly develop adequate technical competence in any one line. An American manufacturer of equipment calling for technical sales competence does himself a disservice by granting an exclusive agency to such a merchant, yet many have made this mistake. Despite the emergence of a new breed of businessmen trained in the latest marketing concepts and techniques, the "bazaar mentality", that the buyer should come to the seller and that the seller's concern with the buyer ends at the moment of sale, is still prevalent among many merchants in Iran.

**Government Procurement.**—While a growing proportion of "big ticket" items is procured by government agencies through public tenders, the bulk of government purchasing is accomplished on the basis of prequalification of suppliers with closed and/or negotiated tenders. The award decision is often made on the basis of indirect factors such as government-to-government considerations, availability of financing, and potential access to other technology and



management offered by the firm. The Foreign Transactions Company (Sherkat Moamelat Khareji), 16 Avenue Karim Khan Zand, Tehran, an agency of the Ministry of Commerce, is responsible for about 10% of all Government procurement. This organization normally handles large scale purchases of basic equipment, supplies, and commodities. It generally is not assigned responsibility for the selection and purchase of highly specialized equipment such as computers or radio transmitters; nor does it procure for the armed forces. Non-military purchases by the Iranian Government in the United States are often handled by the Iranian Embassy, Washington, D.C., on the basis of powers of attorney executed by the ministries concerned.

There are several dozen public-sector procurement organizations with offices in Tehran, each one responsible for taking care of the supply needs of its particular agency. The relevant Government procurement organizations are cited in each chapter. It is normal practice for local agents of foreign manufacturers to register with one or more of these procurement organizations in order to qualify for the purchase or receipt of all tenders issued by that organization.

Most public tenders require a "participation guarantee" (or a "good performance bond"). Standards and specifications are set forth either by the organization itself or by its project consultant. Bidders must adhere strictly to the standards and specifications.

In cases of major purchases being contemplated the public sector procurement organization or its consultant have sometimes looked to foreign manufacturers or their local representatives for technical assistance in drafting the tender notices, and establishing standards and specifications. In a situation of this type, an alert agent can render an invaluable service to his foreign principal.

**State-owned Firms.**—Many industrial units are owned in full or in part by the Government of Iran. In many cases individual ministries are the owners or partners. The principal governmental body for implementing and managing new industrial units, which are usually joint ventures, is the Industrial Development and Renovation Organization (IDRO). This organization owns outright, has an equity investment in, or has contracted licensing agreements for approximately 140 companies involved in manufacturing items as diverse as machine tools and diesel engines. IDRO seeks opportunities for industrial investment and encourages proposals for manufacturing plants. Its operations and investment programs are funded directly from the Government's annual budget. IDRO's headquarters are located in Tehran, at the intersection of Pahlavi Avenue and Jam-e-Jam Street.

**Customers Clearance.**—The entry of goods into Iran can often be a slow, difficult process due to clearance procedures and inadequate cargo handling and storage facilities. An importer is under considerable pressure to clear his goods promptly because of extremely high and regularly increasing storage fees and penalties involving seizure of goods left uncleared beyond a reasonable time.

After initial and usually cursory inspection by customs authorities, incoming goods are placed in storage areas known as "public warehouses." While goods are theoretically stored according to way-bill number or by shipment, facilities and trained personnel are strained to a degree that locating one's goods in the storage areas can often be a time consuming undertaking. Attempts have been made to improve this situation, but the sheer volume of goods arriving in Iran complicate such efforts. While some goods are stored in warehouses, limited capacity has resulted in many goods being stored outdoors where they are afforded little or no protection against the elements.

A very limited number of bonded warehouses exist in Iran; storage fees are high and the warehouse locations are generally at great distance from urban areas. In fact, warehouse space of all types is severely limited, especially close to or in urban areas, due to the relatively low profitability of such operations. There were no known plans to increase bonded warehouse space as of early 1977.

A number of problems developed over the period 1974–1976 which led to a situation of extreme congestion at Iranian ports and at Tehran's Mehrabad Airport. This congestion grew in the freight handling areas, in the Customs areas and in the "public warehouse" areas (to which all goods are sent after customs assessments are made). Many importers failed to clear large quantities of goods ordered prior to mid-1975 when price controls were first instituted, and profit margins were subsequently limited to 15% over the landed cost. As many of these importers had originally under-invoiced their goods in order to save on customs duty charges, the institution of price controls left them in a financially awkward situation. As a consequence the Iranian customs authorities began seizing and auctioning goods not cleared in a timely manner. In December 1976 to encourage prompt clearance, the authorities began to allow deferred payment of customs duties up to 4 months for all goods cleared within 2 months of arrival (deferral on these payments was not previously allowed). In deferral cases, however, the Customs still requires a bank guarantee equal to the amount of duty assessed.

Congestion in Iran's southern ports lessened considerably by early 1977. Containerization is used increasingly, and the establishment of several firms



in Iran specializing in this method of shipment has facilitated the trend. Container shipments enjoy priority off-loading at Iranian ports, thus enhancing the desirability of this mode. Port to port transit time is generally 17 to 20 days for shipments from the East Coast of the United States.

With the exception of winter months, truck shipments from Turkish and European ports have proven to be reasonably rapid and reliable. Transit time from Hamburg, Germany, is usually 14 to 21 days. Congestion at customs areas handling overland shipments was reduced appreciably in late 1976. From approximately November through February, however, road and weather conditions in Eastern Turkey are such that shipments often experience long delays and damage from road accidents.

Air freight shipments, while obviously the most expeditious, have increased beyond the capacity of the normal storage areas. Processing of documents for air freight was falling increasingly behind in early 1977, and even locating shipments in storage areas had become difficult. Another disadvantage of air freight shipping, especially for heavier goods, is the assessment of Iranian customs duties on a c.i.f. basis.

The services of a good freight forwarder are virtual necessities for doing business successfully in Iran. While rates are generally high, the savings in terms of personnel time, paperwork, and executive frustrations are well worth the added expense. A number of freight forwarding firms with international experience are active in Iran. Current information on these firms may be obtained from the Commercial Section of the U.S. Embassy in Tehran. Because of the volume of goods coming into Iran in the post-1973 period, however, the freight forwarding business has become a "seller's market", with all that this implies regarding service for those customers who represent relatively small accounts.

The appendix to this survey entitled "Marketing and Import Procedures" provides details and supplementary information on marketing structure, procurement, and importing in Iran of specific interest to businessmen entering the Iranian market. It also contains information on U.S. Government facilities and programs to assist U.S. businessmen in Iran carried out by the U.S. Department of Commerce's Commerce Action Group for the Near East (CAG-NE), the U.S. Trade Center in Tehran, and the U.S. Embassy and other Foreign Service Posts in Iran.

## Economic Setting

The role of Government investment in Iran's economic growth has been a crucial and dominant factor. A measure of this importance is the fact that the total budget of Iran's public sector in 1976 equalled about  $\frac{2}{3}$  of the Gross National Product (GNP). Centralized allocation of capital resources, embodied in a series of national development plans, has been the cornerstone of government policy. Revenues from oil have historically provided most of the funds required to carry out this policy, although Iran's long-term economic strategy involves developing alternate sources of foreign exchange earnings from industry, gas, and petrochemicals. The results have been impressive; in the space of one generation Iran has developed rapidly toward a modern economy and society from that of a traditional, agricultural economy and tribally oriented, largely illiterate population.

This process, however, has involved considerable "growing pains" which still effect the economy. Although historically a highly resilient society, Iran has begun to feel the stresses of pre-industrialization. These stresses range from incredibly heavy demands on the existing infrastructure to difficulties

occasioned by numerous government measures introduced to lessen the spiraling inflation which began in late 1973. Because of such problems, which are often aggravated by social and cultural factors, the frustrations of doing business in Iran can often obscure the vast potentials which do exist.

Iran's first comprehensive and systematic development effort began in 1955 with the Second Development Plan covering a 7 year period. During the periods of the Third and Fourth Development Plans (1962/63-1966/67, 1967/68-1972/73) the economy averaged a real rate of growth of over 11% per annum. The Fourth Development Plan called for a total of \$10.8 billion in public and private expenditures, primarily in infrastructure and basic industries including metallurgy and petroleum. Most of the major objectives set by the Plan were achieved and a number were exceeded. The Fifth Development Plan (1973/74-1977/78) originally projected total fixed capital investment of \$36 billion, of which about two-thirds was to come from the public sector. The economy was expected to achieve an average annual growth rate of 15.3% increasing GNP to

\$33.4 billion in 1978, with per capita income reaching \$851.

As a result of the increased oil revenues which began in 1973, the Fifth Plan was revised in 1974. Based on a projected increase of total oil revenues from about \$24.6 billion to \$98.2 billion during the Plan period, projected investment was nearly doubled. Increased spending was slated for economic development, social welfare, defense, infrastructure, and public administration. Total planned fixed capital investment was increased to \$69.6 billion (see table 2); GNP was projected to reach \$54.6 billion (at 1973 prices)—representing an average annual increase of 25.9%—and per capita income was to reach \$1,521. High levels of fixed investment were planned for housing (\$13.7 billion), industry (\$11.6 billion), petroleum (\$9.24 billion), transport and communications (\$7.3 billion), agriculture and electric power (\$4.6 billion each).

Indicative of the direction of growth which the planners foresaw for the economy are growth rates projected for the four major economic sectors during the Plan period. Average annual growth rates set by the plan are 51.5% for oil and gas, 18% for industry and mining, 16.4% for services, and 7% for agriculture. Comparison of contribution to GNP at the end of the Fourth Plan in 1973 and projections for sectoral contribution to GNP at the end of the Fifth Plan period are: Oil and gas from 19.5% to 48.7%, industry and mining from 22.3% to 16.1%, service from 40% to 27.2%, and agriculture from 18% to 8%. The impact of growing oil revenues on the economy is indicated by these figures and the fact that growth of value added by the oil and

**Table 2.—Iran: Planned Investment in the Revised Fifth National Development Plan (1973/74–1977/78)**  
(in millions of dollars)

Sector	Total Funds Allocated	% of Total
Housing .....	13,703.7	19.7
Industry (Non-Petroleum) .....	11,557.6	16.6
Oil Industry .....	9,240.0	13.3
Transportation .....	7,291.8	10.5
Electric Power .....	4,600.0	6.6
Agriculture/Natural Resources .....	4,581.5	6.6
Gas Industry .....	2,481.5	3.5
Water Resources .....	2,462.8	3.5
Education .....	1,949.2	2.8
Post and Telecommunications .....	1,352.6	1.9
Mining .....	982.2	1.4
Medical Services .....	677.0	1.0
Other .....	873.8	12.6
	6,961.8	100.0

Source: Plan and Budget Organization.

gas sector was expected to average 51% per annum during the Fifth Plan period, by comparison with value added of agriculture (7% per annum), mining (18% per annum) and services (16.4% per annum). The growing industrialization of the economy is illustrated by the projected shifts in the labor force during the plan period. At the end of the Fourth Development Plan period in 1973, 20.7% of the labor force was engaged in industry and mining, while at the end of the Fifth Plan this figure will have risen to 25.1%. During the same period agricultural manpower is expected to decline from 40.1% to 34.1% of the labor force.

Yearly comparisons of growth indicators within the Fifth Plan period show large fluctuations. GNP at current prices is estimated at \$70 billion for

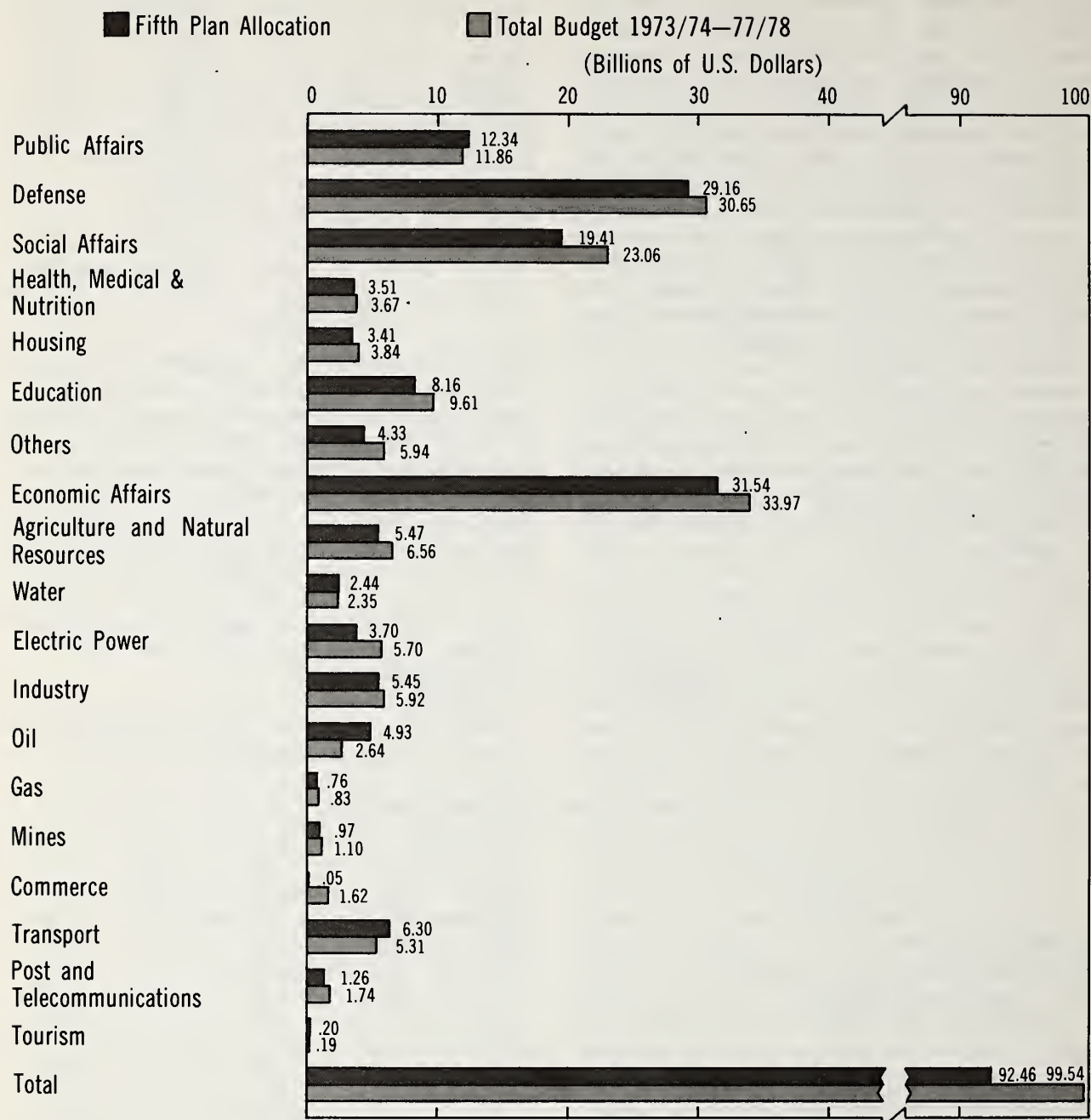
**Table 3.—Iran: Non-military Imports**

Commodity	1975/76		1976/77		% Change 1976/77
	Value in Mill \$	% of total Imports	Value in Mill \$	% of total Imports	
Machinery and parts thereof .....	1,943	18.9	3,121	24.5	60.6
Iron and steel products .....	1,939	18.8	2,201	17.3	13.5
Vehicles and parts thereof, excluding railway .....	1,383	13.4	1,454	11.4	5.1
Electric machinery and parts thereof .....	552	5.4	947	7.4	71.6
Man-made fibers, continuous and discontinuous .....	290	2.8	408	3.2	40.7
Sugar and sugar confectionery .....	418	4.1	383	3.0	-8.4
Cereals .....	606	5.9	359	2.8	-40.8
(Wheat) .....	(384)	(3.7)	(152)	(1.2)	(-60.4)
Chemicals, organic and inorganic and misc. chemical products .....	261	2.5	318	2.5	21.8
Gold, silver, precious metals and stones .....	106	1.0	259	2.0	144.3
Rubber and products .....	161	1.6	257	2.0	59.6
Artificial resins and plastic materials, cellulose esters and ethers, articles of .....	160	1.6	251	2.0	56.9
Pharmaceuticals .....	193	1.9	216	1.7	11.9
Vegetable and animal oil and fat .....	296	2.9	168	1.3	-43.2
Optical, photographic, cinematographic, measuring, medical and surgical instruments .....	136	1.3	163	1.3	19.9
Paper, paperboard and their products .....	154	1.5	155	1.2	0.7
Fruits and nuts, edible .....	132	1.3	142	1.1	7.6
Total Non-Military Imports <sup>1</sup> .....	10,304	100.0	12,752	100.0	23.8

<sup>1</sup> Conversion Rate: US \$1 equals Rls. 68.00 for 1975 and Rls. 70.50 for 1976.  
Source: Official foreign trade statistics of Iran.



**Figure 1**  
**Iran: Comparison of Fifth Plan Targets and Budgets**  
**1973/74-77/78<sup>1</sup>**



1. Target Government Credits for Fixed and Non-fixed Investment, and Current Expenditures in the Revised Fifth National Development, and total allocations by sector in Government General Budgets 1973/74-77/78. Converted from Iranian Rials at the following rates: Fifth Plan totals, U.S. \$1.00=Rls 67.5; Aggregate budget figures, 1973/74-1977/78, U.S. \$1.00=Rls 70.5.  
 Source: Plan and Budget Organization

## PROBLEMS AND PROSPECTS

1976/77 (Iranian year 2535 ending March 20, 1977); previous years were: 1973/74 (2532): \$26 billion, 1974/75 (2533): \$46.7 billion, 1975/76: (2534) \$53.9 billion. As a result of the four-fold increase in oil prices Iran's GNP showed spectacular real growth in 1973/74 (34%) and 1974/75 (42%), dropping to 4.9% in 1975/76 as declining oil production responded to decreased world demand. Real growth was estimated at about 15% in 1976/77; while not equal to the growth achieved during the boom years of 1973/74-74/75, it is favorably comparable to the high rate of sustained growth experienced during 1965/72 (11% per annum). Particularly significant has been growth of the economy's non-oil sectors, which even in 1975/76 expanded by about 20%, and in 1976/77 grew by an estimated 18%. Growth of value added by agriculture was 7%, industry and mining 17%, construction 20%, and services 18%. Per capita GNP, \$1240 in 1973/74, reached \$2,090 in 1976/77. Investment as a percentage of GNP was 30% in 1976/77, about the same level as the preceeding year.

Major factors in growth of the economy in 1977/78 are oil revenues, growth of which is expected to remain static, and inflation, expected to be at least 10%. Based on a conservative estimate of oil earnings, GNP in 1977/78 is placed at \$82.6 billion, up 18%, but representing a rate of real growth of about 8% per annum. Growth of the non-oil sectors is expected to average about 15% per annum.. The total estimated budget for 1977/78, the last year of the Fifth Development Plan period, was \$49 billion, including expenditures and revenues of the self-supporting state enterprises and other agencies, an increase of nearly 10% over the previous year. Anticipated receipts for the Government's \$33.4 billion general operating budget were placed at \$31 billion, of which petroleum revenues were to account for 63% (\$19.5 billion), and taxes 18.9% (\$5.8 billion). Both international and domestic borrowing was expected to be increased; foreign borrowing (\$1.46 billion) was up slightly over the previous year, while a new \$2.16 billion program of domestic borrowing was also included. Largest expenditure allocations in the budget were for Economic Affairs (28.2%), with heaviest emphasis on electric power, \$3 billion; transportation and communications, \$2.4 billion; industry and petroleum, \$1.6 billion each. Planned expenditures for agriculture (\$1 billion) and water resources (\$781 million) were reduced from previous levels, reflecting the Government's emphasis on tackling infrastructure bottlenecks. A total of \$7.9 billion (23%) was earmarked for defense, a reduction from the previous year, while Social Affairs, including education, health, social welfare, housing, urban, and rural development were allocated \$7.7 billion (22%).

When the period covered by Iran's Fifth National Development Plan ends on March 20, 1978 it is estimated that roughly 60% of the Plan goals will be fulfilled, although spending levels provided for in the Plan will no doubt achieve or even surpass the target level of about \$70 billion in capital investment. The Government will account for about two-thirds of these investments and the private sector the remaining third. In the last year of the Fifth Plan period, Iran still has many social and physical infrastructure problems, but has a good financial base and improving manpower capabilities. The "go-for-broke" approach to development adopted when oil revenues quadrupled has had mixed results. In many cases it resulted in unnecessary costs and waste. The rapid infusion of wealth stimulated spiraling inflation and pushed up wages and land values at rates which have become difficult to control. The high public expectations constrain the Government's ability to impose needed fiscal and monetary restraints. Iran's transport system in particular had difficulty in handling the massive influx of goods. Although the crisis of the ports appeared to be over as of mid-1977, the road and rail transport systems remain pressed. Growth of agricultural production continues to drag. Performance in various sectors of the economy has been uneven. It is expected that the Sixth Plan (1978/79-1982/83) will focus on meeting unfulfilled objectives, balancing distortions created by overly ambitious Fifth Plan programs, and implementing measures to achieve long term social goals.

Within the Sixth Plan, it is expected that Iran will focus increased attention on the following areas: Electric power, transportation, social services and education, agriculture, water resources, and certain industries. The Government budget for the Iranian year 2536 (1977/78) in fact included notable increases in funds devoted to these areas. Government spokesmen have indicated that the Sixth National Development Plan (1978/79-1982/83), slated to be unveiled in October 1978, will aim at an overall growth rate for the economy of about 10-12% per annum. However, as of mid-1977, 8-10% per annum appeared to be more realistic. Major constraints in the Sixth Plan period are expected to be availability of foreign exchange, assuming relatively lower oil earnings and the necessity of foreign borrowing, and limited skilled labor resources. Iran will continue to rely on foreign sources for technology, both in terms of capital equipment and human resource skills. The prospects for financing continued development at a moderately rapid pace are excellent, provided the pressures for overspending can be kept in check.

There are several basic assumptions and goals which effect all economic planning in Iran. The



country's long term economic strategy of developing alternative foreign exchange earning sources assumes that oil production will decline to a level of self sufficiency by the early 1990's. Oil revenues have paid most of Iran's investment bills in recent years, and will continue to do so for some time to come. With the general exception of certain defense-related industries, Iran's internal public investment priorities have tended to focus on primary processing and production facilities, or what might be termed the "front-end" of the production cycle. The intention is clearly to look to the private sector to invest in intermediate and final processing and production and for the Government to stimulate such investments through appropriate incentives.

Some policies and programs, however, have been developed since 1975 which may tend to dampen private sector enthusiasm, whether domestic or foreign, for undertaking major investments. They are largely the result of government efforts to "cool down" an economy overheated by the massive influx of oil revenues after 1973, coupled by national overspending in both the private and public sectors; others result from efforts to exert more national control over productive enterprises or to achieve social goals.

1. **Price Controls**—vigorous enforcement was instituted in mid-1975 covering a wide range of products, basic commodities, and services; profit margins are generally limited to 15% of total cost; enforcement, although somewhat uneven, has had negative effects on both the quality and availability of many goods.
2. **Ownership Controls**—industrial firms of a certain size must divest themselves of a 49% share their stock to workers and the public; investment regulations limit foreign equity participation in business enterprises to a range of from 15 to 25%, although high-technology investments are an exception and foreign equity of up to 35% is allowed.
3. **Labor**—regulations on workers' rights and benefits and social security requirements add to the high cost of labor in Iran; labor shortages at all levels of skill contributed to a 35–70% average annual increase in labor costs in the 1975–77 period.
4. **Taxes**—Collection of both personal and corporate taxes is increasingly well enforced; tax rates remain essentially arbitrary although somewhat flexible through negotiation.
5. **Decentralization of Industry**—instituted primarily to achieve social goals; various regulations limit plant expansion and the establishment of new plants to areas well outside the Tehran area; while clearly desirable in the long

term, problems (e.g., limited basic infrastructure, labor supply problems) further increase costs involved.

The principal vehicles used for public sector investment in Iran are state-owned organizations and industrial corporations. While operating within the general guidelines of the Plan, most of these entities are usually independent of centralized controls over procurement decisions. Various governmental and quasi-governmental organizations and banks also lend directly to public and private sector industrial development projects, and often hold equity in these projects. The following general outline illustrates the types of government organizations and channels through which development funds are translated into productive operations:

### **Wholly-Owned State Industrial and Public Utility Corporations**

- Iron and steel
- Oil, gas and petrochemicals
- Railway and airlines
- Electric power
- Telecommunications
- Electronics (military industries)

### **Government Equity Investments and Lending Organizations**

—Industrial Development and Renovation Organization (IDRO) a state-owned holding and investment company, owns or participates as a shareholder in approximately 140 industrial companies.

—Government banks—lend funds for some projects as well as hold equity investments in others (e.g. Agricultural Development Bank, Industrial Credit Bank).

—Ministry Investments—some ministries and government-owned industries invest in productive enterprises not covered by the IDRO mandate (e.g., the public power utility is engaged in a joint venture manufacturing transformers with Siemens of West Germany).

—Grants-in-aid—are made by a number of Government organizations to private institutes for development related activities (e.g., the Iran Center for Management Studies receives annual stipends from the Government)

Major government sponsored projects, such as those discussed in each of the chapters in this survey, play a significant role in the development process which usually exceeds their direct investment components. Many major infrastructure projects involve a tremendous "spill over" effect and open opportunities for goods, services, and capital equipment. An expansion of steel production and processing facilities will create vast opportunities in the con-



struction field. The growth of industrial parks will be of interest to manufacturers of business equipment and systems. Even the apparent domination of any given project by third-country suppliers should not discourage American firms from seeking ways to participate; and precedents for such opportunities are plentiful (e.g. most of the valves to be used in the French-built nuclear power plants discussed in the Electric Power chapter will be of U.S. manufacture). Worth noting, however, is the trend toward increasing cost consciousness in Iran for virtually all purchases, and the growing expectations on the Government's part for foreign cost financing in its major projects.

Oil revenues have clearly been the key contributing factor to Iran's impressive progress to date. In 1976 Iran accounted for 26.6% of Middle Eastern oil production and 10% of world oil output. Iran's reserves are the world's third largest after Saudi Arabia and the U.S.S.R. In the 1976/77 (Iranian year 2535) oil accounted for about 96% of the country's export foreign exchange earnings and oil and gas together 73% of the Government's income. In the same year oil revenues amounted to \$19.4 billion dollars, and it was estimated that for the 1977/78 (Iranian year 2536) the figure would reach \$20.8 billion. Increased foreign borrowing will, however, be necessary to pay ongoing and future development bills. Iran has an excellent credit rating in international money markets, and a sizeable amount of its debt was contracted at a time when rates were favorable to the borrower. Tax revenues are receiving increased attention from the authorities. While past assessments and collections were unevenly enforced, the Government has begun a concerted effort to improve collection procedures and increase overall revenues from tax sources.

Population problems do not weigh heavily on Iran, although one of the most critical problems facing the country in its development process is that of manpower shortages. With a total population of 35.2 million in 1976 and a 2.7% annual growth rate, Iran has a sufficient human resource base. Greatly uneven patterns of population distribution (e.g. 4.5 million residents in Tehran), overall shortages of skilled and even unskilled labor, rapidly expanding technical personnel requirements, an increasing rural to urban population flow, and similar phenomena all contribute to creating serious bottlenecks. Beginning in 1963 with the launching of the Shah of Iran's "White Revolution," Iran has concentrated resources in expanding the base of literacy and education. In very recent years government budgets for formal education and vocational training have increased significantly, even in face of decreased oil revenues and reported cutbacks in defense spending. The Government has also undertaken several job-creation

programs to attract and retain Iranian graduates of national and foreign institutions. The critical factor of rural employment has largely been ignored during the period of rapid growth, but when the construction boom fades there will remain a large and illiterate portion of the work force unable to fit into the modern sector of the economy. Incentives will be required to induce many of these people to return to the rural areas.

## FOREIGN TRADE, AID AND INVESTMENT

Once a foreign aid recipient, Iran has since 1973 become an aid donor. As of early 1977 Iran had made foreign assistance commitments of various types totalling about \$12 billion, and had dispersed approximately \$7.2 billion of that total. High official sources have, however, indicated in the Iranian press that future decreases in the country's oil revenues will result in decreased levels of aid. While much of Iran's foreign assistance funds have gone to developing countries and international organizations, approximately 36% of the total has been provided as loans and credits to industrialized Western nations, principally France and the United Kingdom.

Opportunities for investment in Iran are still numerous. The Fifth Plan projects about \$2.5 billion in new foreign investments during the Plan period. U.S. firms invested \$15.7 million in 1973/74, and \$11.8 million in 1974/75 in Government approved projects eligible for investment incentives. Total value of U.S. investment including oil industry and financial institutions is estimated at \$450-\$500 million. The Iranian Government has attempted to encourage and facilitate foreign investment through a number of laws, Cabinet decrees, and tax regulations. Laws and regulations apply to totally private sectors investments as well as to joint ventures involving Iranian governmental entities. The bulk of foreign investments in Iran are in manufacturing operations and among these local assembly plants employing components manufactured elsewhere tend to dominate. In the post-1974 period, however, investment in various service-oriented ventures have also increased impressively, as have various licensing agreements.

Iran's search for foreign investment presently focuses more on technology transfer rather than on capital. Foreign investment in Iran, whether through government or private joint venture projects, has been notable for the high technology and training components involved. A detailed discussion of this aspect of development is contained in the Education and Training Services chapter in this survey. In the search for new technology and capabilities the Iran-

ian Government has begun investing abroad. The country's most spectacular effort to date, the acquisition of a 25% interest in Krupp Huettenwerke GmbH of Germany, has been cited by the Shah of Iran as an investment in access to technology rather than in a "money-making" operation.

Iran's non-oil exports have traditionally been low in comparison with petroleum exports. In 1976/77, according to official Iranian data, total non-oil exports were valued at about \$763 million, a 3.3% decrease over the previous year. Major components of the country's exports are natural gas, cotton, handwoven carpets, dried fruits, metal ores, motor vehicles and spare parts, hides and skins, textiles and readymade garments, soap and laundry powder, nuts, and chemical products. Leading importers of Iranian products were: U.S.S.R. (29%), West Germany (13%), U.S. (10%) and Italy (5%).

Growth of Iran's imports was phenomenal in the years following the OPEC oil price increases. Growing from \$194 million in 1972, non-military imports totalled \$10.3 billion in 1975/76, and reached approximately \$12.7 billion in 1976/77 (see table 3). Leading supplier nations in order of value of goods imported by Iran in 1976/77 were West Germany (18.1%), the United States (16.9%), Japan (16.1%), and the United Kingdom (7.7%). Main imports from the U.S. were machinery and parts \$609.9 million, transport vehicles \$367.6 million,

cereals \$297.9 million, electric machinery and parts \$181.0 million, iron and steel products \$153.9 million, vegetable oil \$56.7 million, cigarette and tobacco products \$54.7 million, pharmaceuticals \$38.6 million and chemicals \$34.6 million. Table 4 shows exports to Iran for the years 1971, 1973 and 1975 from the United States and from the 14 major western industrialized nations including the United States, which are members of the Organization for Economic Cooperation and Development (OECD). The OECD totals account for approximately 85% of total Iranian imports, and over 90% of all capital goods imports. While these supplier export figures differ from Iranian import figures because of lead and lag, differing customs evaluations and other factors, they are indicative of the overall trends.

Growth of imports from the United States, only 5.3% in 1976/77, declined compared to the previous year, 1975/76, in which they advanced by over 100% and put U.S. suppliers, with a market share of 19.8%, in the leading position over German competitors in that year. The United States is most competitive on quality of goods and in agricultural commodities. The greatest competitive disadvantages are in supplier credit and transport costs, while pricing and product servicing are also potential problems. These factors will become more acute as the Iranian market becomes increasingly competitive and buyers become increasingly price conscious.

**Table 4.—Major Exports From the U.S. and From Organization for Economic Cooperation and Development Countries to Iran**

SITC #	Type	1971		1973		1975	
		U.S.	O.E.C.D.	U.S.	O.E.C.D.	U.S.	O.E.C.D.
00	Live Animals .....	150	615	712	2,678	6,646	10,121
01	Meat and Meat Preparations .....	70	316	180	2,939	1,174	28,132
02	Dairy Products and Eggs .....	323	4,080	219	15,199	231	34,717
03	Fish and Fish Preparations .....	14	96	6	172	10	556
04	Cereals and Cereal Preparations .....	28,921	36,505	83,611	90,056	317,535	359,584
05	Fruits and Vegetables .....	103	294	97	600	1,428	11,539
06	Sugar, Sugar Preparations and Honey .....	21	857	1,144	4,707	2,483	9,390
07	Coffee, Cocoa, Tea and Spices .....	71	587	164	1,883	277	3,949
08	Feeding-Stuff for Animals .....	257	2,498	2,368	8,905	331	5,467
09	Misc. Food Preparations .....	1,897	3,135	1,962	5,356	3,943	53,283
11	Beverages .....	9	486	28	1,724	98	4,615
12	Tobacco and Tobacco Products .....	2,019	2,050	3,610	3,739	24,586	26,345
22	Oilseeds, Oilnuts, Oil Kernels and Flour or Meal of Same .....	7	104	696	780	324	394
23	Rubber-Natural, Synthetic and Reclaimed .....	516	2,920	516	5,727	1,924	10,801
24	Wood, Lumber and Cork .....	30	1,100	134	1,875	1,439	8,964
25	Pulps and Waste Paper .....	1,002	1,553	449	1,439	2,081	7,822
26	Textile Fibers and Their Waste, Raw Silk .....	785	22,297	1,633	46,094	664	122,704
27	Crude Fertilizers and Crude Minerals .....	1,472	3,075	2,990	6,152	29,059	38,623
28	Metalliferous Ores and Metal Scrap .....	23	76	13	668	521	5,467
29	Animal and Vegetable Materials .....	646	1,805	747	4,167	2,501	8,003
33	Petroleum and Petroleum Products .....	1,342	3,699	2,720	7,628	5,484	18,587
41	Animal Oils and Fats .....	3,148	3,165	6,401	7,048	5,224	6,172
42	Vegetable Oils and Fats (Non-hydrogenated) .....	23,779	27,204	11,423	22,033	77,447	94,977
43	Fatty Acids, Waxed, and Hydrogenated Fats and Oils .....	62	1,057	37	1,685	262	3,651
51	Chemical Elements and Compounds .....	5,008	25,768	5,408	46,570	20,977	106,102
53	Dyeing, Tanning and Coloring Materials (Natural and Synthetic) .....	0	15,403	604	34,760	1,318	56,023
54	Medical and Pharmaceutical Products .....	7,631	32,134	12,605	71,838	22,220	151,973
55	Essential Oils and Perfume Materials .....	413	3,904	716	8,038	2,592	18,243
56	Manufactured Fertilizers .....	1,579	11,929	29	300	47,319	50,692



**Table 4.—Major Exports From the U.S. and From Organization for Economic Cooperation  
and Development Countries to Iran—Continued**

SITC #	Type	1971		1973		1975	
		U.S.	O.E.C.D.	U.S.	O.E.C.D.	U.S.	O.E.C.D.
57	Explosives and Pyrotechnic Products (incl. hunting ammunition) .....	247	3,398	2,992	8,497	2,623	15,849
58	Synthetic Resins, Regenerated Cellulose and Plastic Materials .....	1,503	19,321	10,081	66,161	11,183	126,202
59	Chemical Products and Materials, N.E.C. ....	3,906	16,134	5,993	38,732	23,012	100,838
61	Leather, Leather Manufactures and Dressed Furskins. ....	34	637	101	1,588	421	3,551
62	Rubber Manufactures—Semifinished and Finished ...	1,077	17,647	2,867	40,373	10,144	118,675
63	Wood and Cork Manufactures .....	95	3,168	157	3,908	920	37,431
64	Paper, Paperboard and Manufactures Thereof .....	3,460	15,183	4,514	35,447	17,534	77,940
65	Textile Yarn, Fabrics, Made-up Articles, Related Products .....	2,031	58,052	7,715	160,383	12,564	245,543
66	Nonmetallic Mineral Manufactures, N.E.C. ....	1,334	16,526	1,773	36,598	4,865	100,347
67	Iron and Steel .....	6,901	145,826	19,359	352,630	249,269	1,495,305
68	Nonferrous Metals .....	2,006	18,223	1,380	40,548	3,341	102,691
69	Metal Manufactures, N.E.C. ....	6,352	47,085	13,628	86,349	42,919	384,555
711	Non-electric Power Generating Machinery .....	24,436	49,288	38,551	114,255	64,881	294,699
712	Agricultural Machinery .....	3,930	9,301	11,148	45,607	80,178	179,067
714	Office Machines and Parts .....	1,320	6,702	2,762	21,447	21,648	62,939
715	Metalworking Machinery .....	1,831	22,093	4,569	29,551	31,387	106,271
717	Textile and Leather Machinery .....	4,166	30,646	4,086	82,969	4,184	209,412
718	Special Industries Machinery						
	.1 Paper and Pulpmill .....	212	1,510	424	11,050	1,404	12,136
	.2 Printing and Bookbinding .....	26	2,740	593	7,192	2,071	18,196
	.3 Food-processing .....	108	11,160	132	4,929	2,371	22,519
	.4 Construction and Mining .....	10,484	16,529	46,211	79,935	152,516	368,483
	.5 Mineral Crushing, Sorting, etc. ....	398	18,043	1,346	21,636	16,022	155,116
719	Machinery and Appliances						
	.1 Heating and Cooling .....	10,780	28,361	14,931	51,328	67,752	209,781
	.2 Pumps, Compressors, Filtering Equipment .....	8,244	25,881	17,182	52,627	41,149	169,852
	.3 Mechanical Handling Machinery .....	2,718	15,216	7,629	33,273	72,809	228,809
	.4 Domestic Appliances (non-elec.) .....	219	838	51	1,448	382	5,153
	.5 Power Tools .....	537	5,469	670	12,842	4,245	46,688
	.6 Calendering, Bottling, Packaging, Weighing, Vending, etc. ....	1,352	6,317	1,560	12,772	6,411	56,905
	.7 Bearings .....	462	2,376	1,207	6,138	2,751	12,800
	.8 Mechanical Appliances .....	3,340	26,636	6,692	49,357	29,793	171,417
	.9 Metal Foundry Moulding Boxes, etc. ....	4,343	19,629	7,755	46,378	19,689	116,567
722	Electric Power Machinery and Switchgear .....	5,104	46,863	15,008	78,599	28,482	235,402
723	Electric Distribution Equipment .....	510	11,327	2,014	30,104	40,166	111,537
724	Telecommunications Apparatus .....	14,006	88,881	14,484	109,699	50,108	248,826
725	Electro-thermic and Electro-mechanical Household Equipment .....	383	8,391	1,165	17,412	11,640	76,264
726	Electro-medical and Radiological Apparatus .....	1,070	2,336	1,657	4,523	4,278	11,063
729	Electric Machinery .....	4,397	36,689	8,842	71,604	30,883	175,321
731	Railway Vehicles .....	14,660	18,765	7,560	10,460	14,812	62,248
732	Road Motor Vehicles .....	27,658	85,677	42,842	283,089	407,836	1,515,512
733	Other Motor Vehicles .....	1,002	2,245	1,015	6,865	79,651	126,050
734	Aircraft .....	54,807	84,717	65,127	108,664	301,625	399,893
735	Ships and Boats .....	199	2,048	393	46,989	5,257	100,236
81	Sanitary, Plumbing, Heating and Lighting Fixtures ..	702	6,415	722	13,525	3,233	32,409
82	Furniture .....	291	4,221	330	3,718	1,699	19,522
84	Clothing and Accessories .....	196	2,701	197	3,563	1,164	10,135
86	Scientific, Medical, Optical, Measuring and Control Apparatus, Watches, Clocks .....	8,364	33,627	7,884	59,755	19,446	164,863
89	Misc. Manufactured Articles .....	1,981	18,546	3,214	34,203	23,885	102,095

Source: Organization for Economic Cooperation and Development, "Trade by Commodities, market summaries, volume II, Imports", 1971-75



# Agro-Industry

During the 1970's, the Iranian government has shown increasing concern about agriculture as a critical area of the national development effort. The low growth of agricultural production and rapidly expanding imports of food convinced government planners that a larger proportion of the country's oil revenues should be allocated to agricultural development. Despite extensive plans and large expenditures, however, the modernization of Iran's agriculture will take 10 to 20 years. Moreover, the planners' target of a sustained 7% growth rate in agricultural production cannot be achieved before the mid-1980's, and until then agricultural production will most likely grow at an average annual rate of only 5%.

The 1975 sales of agricultural equipment in Iran totalled \$173 million and an average growth of about 12% per annum is expected through 1980. In this period, the equipment market should grow at a substantially faster rate than agricultural production because of the projected expansion of farm mechanization and the high growth rate of capital-intensive dairy and poultry farm operations. The fastest growing major equipment group in terms of sales is expected to be dairy farm equipment. This group should expand at 20% per year, rising from sales of \$3.8 million in 1975 to over \$9 million in 1980. Sales of poultry farm equipment and certain types of harvesting equipment should grow at close to 14% per annum. Potentially large and rapidly growing markets also exist for specialty equipment such as farm trailers, power mowers, and grain handling equipment. Despite the strong market position of many European companies, the rapidly growing agricultural equipment market in Iran offers excellent opportunities for American companies which undertake aggressive product and marketing strategies.

## INDUSTRY STRUCTURE AND SIZE

In 1974 the total amount of land devoted to agricultural production in Iran was 8.6 million hectares, slightly over 5% of the nation's total surface (see table 1). Approximately 3.8 million hectares were irrigated. Most agricultural production in Iran is still done by small farmers using traditional farming methods. The Government is making a determined

*Table 1.—Iran: Land Use, 1974*

Type of land	Millions of hectares	%
Cultivated total .....	8.6	5.2
Irrigated .....	3.8	
Dry farming .....	4.8	
Fallow .....	10.0	6.0
Pasture .....	10.0	6.0
Forest .....	14.5	8.8
Non-cultivated arable .....	31.0	18.9
Non-arable .....	88.5	53.6
Developed (cities and roads) .....	2.4	1.5
Total .....	165.0	100.0

Source: Ministry of Agriculture and Natural Resources, National Cropping Plan, Bookers Agricultural and Technical Services Ltd.

effort to raise agricultural production but in spite of large government investments and credits, production is lagging behind government goals. Wheat production in 1975 was 4.7 million tons, rice 1.3 million tons and barley 900,000 tons. Wheat and barley are grown on approximately 70% of the cultivated land (see tables 2 and 3). In addition to these domestically produced food crops, the Government imported 1.8 million tons of grains and cereals.

During 1975, Iran produced 1.2 million tons of sugar cane which was double the 1970 production. Sugar beet production grew from 3.8 million tons in 1970 to 4.4 million tons in 1975. These crops have shown good annual growth increases because of heavy government investment through Iran's new agribusiness ventures and these crops lend themselves well to mechanized production.

Production of other industrial crops decreased. Cotton production, for example, declined from 615,000 tons in 1974 to 505,000 tons in 1975. Tea, tobacco, and oilseeds have shown little growth in production since 1970.

Nut, fruit, and vegetable production showed little growth in the 1973-75 period. Most vegetable farms and fruit orchards are owned by small farmers.

Livestock production plays an important role in Iran's economy, and livestock products account for nearly 40% of the value of agricultural production. Iran's livestock population in 1975 was estimated at 32 million sheep, 9 million goats, 7 million cattle and 65,000 hogs. Over 370,000 tons of red meat

**Table 2.—Iran: Production of Principal Agricultural Products**  
(thousand tons)

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>2</sup>
<b>Grain</b>						
Wheat .....	4,000	4,500	4,600	4,700	4,820	5,343
Barley .....	880	1,009	923	863	890	1,010
Rice (husk) .....	1,060	1,200	1,374	1,313	1,366	1,597
Maize .....	NA	NA	30	50	60	124
Other Grains .....	NA	NA	NA	60	64	80
<b>Industrial Crops</b>						
Cotton .....	517	600	615	505	515	558
Sugar Beets .....	3,800	3,918	4,240	4,430	4,610	5,389
Sugar Cane .....	539	700	1,050	1,195	1,395	2,350
Tea (Green) .....	86	88	93	98	101	114
Tobacco .....	17	27	15	14	14	15
Oilseeds .....	58	54	57	79	84	111
Tree Fruits & Nuts .....	1,433	1,645	1,655	1,707	1,843	2,508
Annual Fruits .....	1,310	1,395	1,619	1,632	1,746	2,289
Vegetables .....	415	862	680	780	850	1,200
Pulses .....	107	186	145	179	188	228
Forage .....	1,251	2,122	1,850	2,000	2,120	2,676
<b>Livestock</b>						
Red Meat .....	296	295	300 #	325 #	338	395
Poultry Meat .....	52	71	98	115	128	194
Eggs .....	72	73	89	110	119	161
Milk .....	1,880	2,000	1,900	2,000	2,140	2,805

1. Projections based on 1976 hectareage of various crops, expected plantings during the next four years, likely improvement in yields of specific government incentive programs in operation in 1976.

2. Official Ministry of Agriculture figures for these years are 501 and 550 thousand tons respectively, based on slaughter-house throughput and including imported live animals. Figures in the table are estimates of red meat raised in Iran during 1974 and 1975.

Source: Ministry of Agriculture, Statistical Center of Iran and estimates based on trade interviews.

**Table 3.—Iran: Major Agricultural Products**

<b>Irrigated Crops</b> (Thousands of Hectares—1973)	
Wheat .....	1,665
Barley .....	377
Rice .....	381
Maize and sorghum .....	37
Pulses .....	185
Oilseeds .....	85
Cotton .....	308
Sugar Beets .....	177
Sugar Cane .....	9
Potatoes .....	50
Cucurbites .....	134
Market garden crops and nuts .....	71
Fruit .....	585
Fodders .....	361
Total .....	4,425 <sup>1</sup>
<b>Dryland Crops</b>	
Wheat .....	3,890
Barley .....	1,144
Other .....	825
Total .....	5,859 <sup>2</sup>
<b>Livestock</b> (Thousands of head—1975/76 est.)	
Sheep .....	32,000
Goats .....	9,000
Cattle .....	7,000
Water buffalo .....	220
Horses and Mules .....	400
Asses .....	2,000
Camels .....	200
Pigs .....	65
Poultry .....	60,000

<sup>1</sup> Includes 825,000 hectares of dryland crops other than wheat and barley and also listed under the dryland category. The actual irrigated hectareage is 3,600,000.

<sup>2</sup> The amount of dry land cultivation varies greatly from year to year, depending on the amount of rainfall and other variables.

Source: Ministry of Agriculture, National Cropping Plan, Bookers Agricultural and Technical Services Ltd., Iran Almanac 1976.

were produced in 1975. Of this total, 70% was produced from sheep raised by traditional methods by the nation's nomadic tribes and villagers. Iran's annual broiler production was approximately 85 million birds in 1975, but only four broiler producers had an annual capacity of a million birds or more.

Total capital expenditures in the agricultural sector grew from \$142 million in 1970 to \$1 billion in 1976. Capital expenditures include investment in land development and irrigation facilities, the purchase of breeding animals, farm machinery, and buildings, and a variety of other capital assets. The rapid growth in capital expenditures during the early 1970's resulted from large direct government investment in agriculture and government credits made available to farmers.

In the 1970's, Iran became a net importer of agricultural products. In the foreseeable future, the large demand for food products in Iran will preclude the development of food exports for most commodities. However, a number of Iranian agricultural products have traditionally been exported. During the 10 years 1966–1976 several of these exports, such as cotton, animal hides and a variety of nuts and dried fruits, achieved significant volumes.

The Iranian agricultural economy is characterized by a variety of types and sizes of production units. In the mid-1970's there were 70 large units with land holdings of more than 500 hectares each, and 250 semi-large units which farm between 300 and 500 hectares each. These 320 units include agribusi-



**Table 4.—Iran: Agricultural Production Units by Size of Holding (1974)**

	No. of units	Size of Holding Hectares	Total Land	Annual Cultivation	
				Irrigated	Dryland
Large Units <sup>1</sup> .....	20	5000- & over	210,000	30,000	25,000
	50	501 - 5000	120,000	10,000	25,000
Semi-Large Units .....	250	301 - 500	120,000	20,000	40,000
Total .....	320		450,000	60,000	90,000
Medium Farmers .....	1,000	201 - 300	270,000	55,000	58,000
	4,000	101 - 200	620,000	110,000	110,000
	40,000	51 - 100	2,550,000	310,000	335,000
	600,000	10 - 50	9,250,000	1,525,000	2,180,000
Total .....	645,000		12,700,000	2,000,000	2,675,000
Small farmers .....	1,200,000	3 - 10	4,950,000	927,000	1,740,000
	1,000,000	0.5 - 3	2,100,000	450,000	620,000
Total .....	2,200,000		7,050,000	1,377,000	2,360,000
Migrant Herdsman .....	100,000				
Landless Peasants .....	700,000				
Grand Total .....	3,645,320		20,000,000	3,437,000	5,122,000

<sup>1</sup> Includes Agribusinesses, farm corporations, production cooperatives and large commercial farmers.

Source: Compiled from figures issued by Statistical Center of Iran.

nesses, farm corporations, production cooperatives and large commercial farmers. In 1974 they had a total of 60,000 hectares of irrigated land and 90,000 hectares of dry land under cultivation (see table 4). They were using the country's most modern methods of farming including mechanization and row cropping. There were 645,000 medium-sized farms with land holdings of 10 to 300 hectares. The largest number of these medium sized farms have holdings of 10 to 50 hectares. Iran also had 2,200,000 small farms, ranging in size from .5 to 10 hectares. While these small farms are numerous, they are not easily mechanized because of their small size and do not constitute a large market for farm equipment. The types of farm units in Iran can be divided into the following classifications; Private agribusiness companies, government agricultural projects, farm corporations, production cooperatives, commercial farmers, and peasant farmers.

**Private Agribusiness Companies.**—Since the late 1960's, government policy has emphasized the establishment of large-scale modern farm enterprises with joint Iranian and foreign investment. Government planners believe that operations which combine a variety of farming or livestock operations, called "agribusinesses" in Iran, will most efficiently use the land and water resources of the irrigation areas below the dams constructed during the period of the Fourth and Fifth Development Plans (1967/68–1977/78). During the early 1970's, the Ministry of Agriculture expanded the concept of agribusiness to include food processing operations, meat complexes to fatten sheep and cattle, and large scale dairies (see table 5).

In accordance with the Ministry's original concept, the minimum size of an agribusiness is 5,000 hectares. The agribusinesses lease undeveloped or semi-developed land, receiving 30-year leases on land and

**Table 5.—Iran: Government and Private Agribusinesses <sup>1</sup>**

Government	Hectarage <sup>2</sup>	Major Crops
Moghan Agro-Industry Company	35,000	Field crops, orchards, livestock
Karoun Agro-Industry Company	25,000	Sugar
Haft-Tappeh Sugar Cane Company	10,000	Sugar
Sefid Rud Agro-Industry	10,000	Crops, livestock
Sharoor Agro-Industry	8,000	Field crops, fodder, livestock
Jiroft Agro-Industry Company	3,000	Field crops, livestock
Fars Industrial Meat Complex	1,000	Red meat, alfalfa
Silk Industrial Complex	600	Silk
Kashan Perfume Company	500	Perfume
Iran Milk Industries	N.A.	Milk
Lorestan Industrial Meat Complex	N.A.	Red Meat
Ziaran Turkey Industrial Complex	N.A.	Turkey Meat
<i>Private</i>		
Iran America Agro-Industrial Company	20,263	Field crops, livestock
International Agro-Business Corporation	16,690	Field crops, livestock
Iran Shellcott	15,796	Field crops
Iran California Company	10,500	Field crops
Galeh Agro-Industrial Company	4,010	Field crops, milk
Eghted Sugar Company	1,800	Sugar
Koorosh Agro-Industry	1,600	Livestock, fodder
Neka-Bazr Company	1,300	Seeds
Dashte Morghab Company	600	Canned food
Magsal	400	Fodder, livestock
Chin-Chin Agro-Industrial Company	300	Canned food, orchards
Pak-Teen Company	300	Canned food
Shalika Company	191	Silk
Broan Company	100	Almonds
Gulsara Company	100	Pistachio
Maher Company	100	Pistachio, fodder
Manuchehr Kalo Company	23	Orchards
Gol Nahal Company	21	Orchards
Nousari Company	20	Cotton
Poyam Company	18	Orchards
Afshin Company	8	Orchards
Ziaran Meat Complex	N.A.	Red Meat

<sup>1</sup> Projects which had commenced farming operations by 1975.

<sup>2</sup> Hectarage to be developed upon completion of project.

Source: Ministry of Agriculture.

water at subsidized rates in return for investment in land development and irrigation networks. The Government also offers the agribusinesses low interest long-term loans and equity funds through the Agricultural Development Bank of Iran (ADBI). Eventually, the Government-owned Khuzistan Agricultural Services Co. (address: 553 Hafez Ave., Charah-College, Tehran), formed in 1976, will market a variety of farm equipment and services to the agribusinesses.

The initial geographic focus for the development of agribusiness projects was the 100,000 hectare Dez Irrigation Project in the province of Khuzistan. Between 1968 and 1973, the Government attracted the participation of Iranian investors and several foreign companies for the establishment of four agribusiness companies in this area. These were:

Name of Agribusiness	Date Established	Hectares	Investors
Iran-America Agro Industrial Co.	1970	20,263	N H. Agro-Industrial Company, Private Iranian Investors, ADBI
Iran California Co.	1970	10,500	Transworld Agricultural Development Corporation, Bank of America, ADBI, John Deere and Co. Private Iranian Investors, Khuzistan Water and Power
Iran Shellcott	1971	15,796	Shell International, Mitchell Cotts Development Finance Co. Limited, ADBI, Bank Omran
International Agro-business Corporation of Iran	1973	16,690	ADBI, Ahwaz Sugar Beet and Refinery Co., Khuzistan Water and Power Authority, Chase International Investment Corporation, Mitsui and Co. Limited, Hawaiian Agronomics Co. International, Diamond A Cattle Company

The companies developed large tracts of land, purchased substantial amounts of agricultural equipment (see table 6), hired dozens of foreign technicians and by 1976 were farming 20,000 hectares. The basic cropping program of the agribusiness companies is a rotation of wheat, sugar beets and alfalfa. Iran-America Company planted 150 hectares of deciduous fruit trees, 450 hectares of citrus orchards, and 70 hectares of grapes and built up a flock of 17,000 sheep. The company planned to expand its orchard program by planting another 120 hectares of citrus trees, 35 hectares of deciduous fruit trees, and 70 hectares of grapes in 1976 and 1977. Iran California pursued the most diversified crop program, growing wheat, barley, sugar beets, alfalfa, milo, corn, cotton, field beans, sesame, and peanuts.

**Table 6.—Iran: Basic Farm Equipment Inventory of Two Agribusinesses in Khuzistan**

Shellcott (1975)		Iran California (1976)	
Tractors	Units	Tractors	Units
John Deere 3120 (81 HP) ..	11	John Deere 5020 .....	8
Massey-Ferguson 178 (27 HP) .....	5	John Deere 4020 .....	7
Massey-Ferguson 1080 (88 HP) .....	15	John Deere 3020 .....	4
Massey-Ferguson 1150 (150 HP) .....	3	John Deere 3120 .....	1
Muir Hill 111 (110 HP) ...	3	John Deere 2120 .....	2
Muir Hill 161 (160 HP) ...	2	Romanian Universal .....	7
<i>Other Equipment</i>		International Harvester 10-66	4
John Deere 950 Combines ..	2	Muir Hill 161 .....	3
Massey-Ferguson 65 Combines .....	2	<i>Other Equipment</i>	
International Cotton Harvesters .....	5	John Deere 860 Scrapers ...	5
Disc Harrows .....	12	Hancock Scrapers .....	4
Heavy offset disc harrows ...	2	John Deere 950 Combines ..	2
Land plows .....	4	John Deere 630 Combines ..	4
Two-way plows (4-5 bottom) .....	2	John Deere Sugar Beet Harvesters .....	5
Rolling cultivators .....	11	Alfalfa Cuber .....	1
Six-row planters .....	3	Miller stubble discs .....	2
Bedders .....	3	John Deere offset discs .....	12
Field cultivator .....	1	8-Row planting sleds .....	3
Flail choppers .....	5	Plows .....	2
Chisel plow .....	1	Road graders .....	2
Heavy duty subsoiler .....	1	International Harvester balers	2
Bed shapers .....	3	John Deere balers .....	2
		John Deere self-propelled spreaders .....	2
		John Deere field choppers ..	2

Source: Trade interviews.

Iran California also farmed substantial areas of vegetables under joint venture arrangements with local vegetable farmers.

Despite their ambitious start, the agribusiness companies have not been successful operations. The crop yields achieved by the agribusinesses are significantly lower than the yields originally projected for the projects. They do not compare favorably with crop yields achieved by the better commercial farmers in the same province of Khuzistan. The combination of low yields, high equipment costs, and excessive overhead costs have led to chronic financial losses, cash flow squeezes, and crisis management. The deficit operations of the agribusinesses have been underwritten by a series of sizeable "rescue" loans and equity contributions by ADBI. In the face of growing losses, the private foreign and Iranian investors have been unwilling to increase their equity investments and ADBI has become a major shareholder in several of the agribusinesses. ADBI has taken over the management of Iran California, Iran-America, and Shellcott.

The initial difficulties of the agribusiness companies does not necessarily indicate a failure of the concept. Government officials in both the Ministry of Agriculture and ADBI realize the large invest-



ment required to stimulate agricultural growth. During the 8 years 1969–1976, the impact of the agribusinesses on the agricultural environment in Khuzistan has been extraordinary. The operations of the agribusiness companies have served as a major demonstration project for mechanized agriculture. The local farmers in Khuzistan have adopted many of their techniques of modern farming such as row cropping, mechanization, and the use of fertilizers and other farm chemicals.

During 1975, several developments in Khuzistan augured well for the longrun development of the agribusinesses. That year, two new investors invested in Iran America despite the company's large losses. The large hectareage of deciduous trees and citrus planted by Iran America began to produce a substantial cash flow which will ease the company's financial problems and provide funds for reinvestment. The performance of the agribusinesses will undoubtedly improve as management gains experience in adopting modern farm technology to the local conditions and identifies crops and varieties suitable to Khuzistan. Moreover, it is likely that the organizational structure and roles of the agribusinesses will change over time.

By the beginning of 1976, two private livestock feedlot projects had initiated activities. The Magsal Company, located near Qazvin in the Central Province, is the first modern livestock feedlot in Iran. Magsal began operations by feeding approximately 1,100 head of domestic cattle and had plans to install modern feeding and manure handling systems to handle 8,000 head of cattle by early 1977. The Ziaran Meat Complex, located near Magsal, began constructing a feedlot, feedmill, and slaughterhouse in 1972. The project is designed to have an annual fattening capacity of 100,000 cattle and 500,000 sheep.

**Government Agricultural Projects.**—The failure of private investors to establish profitable agribusiness projects has motivated the Government to establish and manage several large agricultural projects. The first government project was the Haftappeh Sugar Cane Project in Khuzistan. It began to operate at full capacity in 1974. Designed and assisted by the Hawaiian Agronomics Company, the project farms 10,000 hectares of sugar cane which is processed into refined sugar. Haftappeh's average yield of 12.5 tons of refined sugar per hectare represents one of



*Modern agricultural technology including mechanized harvesting is used in large government-owned agro-industrial projects such as the U.S.-designed Haftappeh sugar cane enterprise in Khuzistan.*



the world's highest sugar yields. The success of the Haftappeh project and the severe shortage of sugar in Iran led the Government to establish a second sugar cane project, the Karoun Sugar Cane Company, in Khuzistan, in 1975. The company will farm 25,000 hectares after 5 years of development and will ultimately produce 250,000 tons of sugar per year. By 1976 the company had planted 400 hectares of cane nursery and commenced construction of processing facilities. The total investment in the project is estimated at \$709 million.

The most ambitious and far-reaching of the Government's projects is the Moghan Agro-Industry Co. in northwestern Iran. The company will eventually farm 35,000 hectares of irrigated crops and orchards. In 1976 it was farming 13,000 hectares, had planted 300 hectares of deciduous fruit trees, and was in the process of installing the first 1,000 hectares of drip irrigation for the orchards. Eventually the company plans to develop 6,000 hectares of tree crops. Moghan Agro-Industry also has built a feedlot with an annual feeding capacity of 600,000 sheep. In late 1976 they were fattening 30,000 animals. A slaughter house with a daily capacity of 4,000 sheep and 250 beef cattle will be constructed. The project also has plans for a 10,000-head dairy operation and a poultry complex with an annual capacity of 2 to 3 million broilers and 780,000 layers.

The government feedlot projects in the provinces of Fars, Kurdistan, Lorestan and Azarbaijan are part of the tribal development programs. A large government meat complex located at Marv Dasht in Fars Province started operations in 1976. The Fars Industrial Meat Complex will ultimately fatten and slaughter 1.5 million sheep per year. In 1976 the company was fattening sheep purchased from local flock owners or imported from Australia, but the complex had plans to develop a sheep flock of 50,000 ewes and grow a portion of its feed and fodder requirements on approximately 1,000 hectares of land. The Complex also plans to develop meat packing facilities, a tannery and a carpet-making operation.

#### **Farm Corporations and Production Cooperatives.**

—The farm corporations and production cooperatives were established in the early 1970's to consolidate the large number of small holdings created in the 1960's by land redistribution during land reform. The objective is the creation of large farm enterprises which can be mechanized and farmed in an efficient and modern fashion. A farm corporation is formed when a majority of villagers in an area agree to consolidate their lands. The farmers exchange the permanent farming rights of their land for shares in the farm corporation. Farmers receive wages paid for labor and a share of the farm corporation's profit. The corporations are managed by agricultural engi-



*Sheep feedlot project in Dezful.*

neers appointed and paid by the Ministry of Agriculture. The Ministry also finances land levelling and the construction of farm buildings, irrigation facilities, housing, schools, and medical clinics. Through the Agricultural Cooperative Bank, the Ministry provides low interest loans for working capital, the purchase of farm equipment, and other capital investments. Through the Agricultural Development Machinery Organization (address: 86 North Kakh Ave., Tehran), the Government buys equipment such as tractors for resale to farmers.

The first farm corporation was established in 1967. By 1976, 88 farm corporations were operating. The original target for the Fifth plan was the establishment of 140 farm corporations. However, due to cut-backs in Iran's development budget in 1976 and 1977, only 100 farm corporations will be established by 1977. The farm corporations are expected to farm approximately 435,00 hectares by the end of the Sixth Plan in 1983.

The planners in the Ministry of Agriculture plan to expand the profits of the farm corporations by establishing processing activities. The processing activities will include dairy plants, meat processing, feed mills, and cold storage. By 1976, three farm corporations had begun dairy operations and five more were planning their establishment.

The Production Cooperative is another attempt to consolidate small holdings into large units. The



farmers who join production cooperatives retain full ownership of their land while receiving management services and low-interest loans from the Ministry of Agriculture. Moreover, the farmers have access to a pool of machinery and their output is marketed collectively. By 1976, 34 production cooperatives had been organized and the Ministry planned to have 100 established by 1982. These 100 production cooperatives would farm approximately 180,000 hectares.

**Commercial Farmers.**—Commercial farmers can be divided into two groups: farmers with between 10 and 100 hectares of land and farmers with more than 100 hectares of land. Commercial farmers with between 10 and 100 hectares of land constitute the most significant and potentially productive group of farm production units in Iran. The 600,000 farmers in this group farm approximately 4.3 million hectares of irrigated and non-irrigated land. They represent about 17% of the total number of farm units in Iran. Commercial farmers produce an estimated 47% of the country's sugar beet crop, 46% of the wheat crop and 40% of the national cotton crop. They also play a major role in the production of poultry and eggs. In general, these farmers live on their farms and earn more than 90% of their total family income from the proceeds of farm sales.

The large commercial farms range in size from 100 hectares to more than 2,000 hectares. In this category, there are approximately 5,000 farm units with 400,000 hectares under cultivation. Large commercial farmers are generally former landlords who retained a portion of their farm holdings after land reform. These farms produce wheat crops by fully mechanized means, and sugar beet and cotton crops by methods partially mechanized.

Despite the importance of commercial farmers to Iran's agriculture, the government's policies have generally neglected them. The interests and needs of these farmers have gone unnoticed because of the government's emphasis on small farmers through the development of rural cooperatives and farm corporations on one hand, and the support of agribusinesses on the other. Several studies have indicated that the critical barrier to the rapid improvement of medium-sized farm operations is the shortage of capital to finance purchases of equipment for modern farming.

During 1976, ADBI decided to put a major emphasis on medium-sized commercial farmers. That year, the Government instituted a new policy to enable the Ministry of Agriculture to guarantee loans to farmers who do not have proper title deeds to their lands. In previous years, the lack of adequate title deeds prevented many medium-sized farmers from meeting the ADBI collateral requirements. This caused ADBI to neglect medium-sized farmers in favor of large commercial farmers and agribusinesses. The implications of this policy shift are ex-

tremely significant for Iranian agricultural development.

**Peasant Farmers.**—Iran's 2.2 million peasant farmers farm an average of 1.7 hectares of land each and account for 40% of Iran's total crop production. The peasant farmers generally produce wheat, rice, pulses, and vegetables. Average yields and income earned are extremely low. Rural Cooperative Societies were formed after land reform to service the financial and marketing needs of the peasant farmers. In 1975, 2.5 million farmers were members of 2,849 rural cooperatives. The Rural Cooperative Societies distribute and supervise loans made by the Agricultural Cooperative Bank which loaned \$454 million to peasant farmers and cooperative societies in 1975. The majority of the loans were used for working capital and the purchase of livestock.

## Government Organizations

There are a number of government ministries and organizations that have impact on agriculture in Iran. In November 1976, the decision was made to dissolve the Ministry of Cooperatives and Rural Affairs (MCRA) and to merge its operations with the Ministry of Agriculture and Natural Resources (MANR) located on Elizabeth Boulevard, Tehran.

**The Department of Agribusiness and Meat Complexes.**—This agency, part of MANR, is responsible for encouraging investment in large scale farming projects and aiding investors and farmers in implementing these projects.

**The Extension Service.**—Also part of MANR, the Extension Service provides technical assistance to farmers throughout the country.

**The Agricultural Development Bank of Iran.**—ADBI was established by MANR and provides both loan and equity capital to agricultural projects. ADBI funds come mainly from government development credits, but ADBI has also received loans from the World Bank. ADBI also holds equity positions in the regional development banks in Khuzistan, Azarbaijan, and Gilan and it jointly administers loans with the Industrial and Mining Development Bank and Bank Melli.

**The Agricultural Cooperative Bank.**—The ACB has been under the control of the MCRA and provides credit to farmers through rural cooperatives throughout the country.

**The Organization of Farm Corporations and Producers Cooperatives.**—The OFCPC has a major planning, management, and technical role in the programs of farm corporations and producers cooperatives.

### **The Central Organization of Rural Cooperatives.**

—The CORC maintains a network of provincial and local offices to manage the system of rural cooperatives.

### **The Urban and Rural Consumer Cooperatives.—**

The URCC is a marketing organization to distribute cooperative products in the cities and foodstuffs to the rural areas.

A number of other ministries have activities that bear on agro-industry in Iran. The Ministry of Energy develops dam and irrigation projects. The Ministry of Commerce controls the grains, tea, and sugar organization and sets prices for many agricultural products, particularly imports.

## **TRENDS, PROGRAMS AND PROJECTS**

After 1962 agriculture in Iran lost its inhibiting feudal character and by 1976 had significant growth opportunities. The critical factor in the recent transformation of agriculture was the comprehensive and highly successful land reform program undertaken by the Iranian government from 1962 to 1971. Only orchards and mechanized farms were exempted from land redistribution as 7 million hectares of land were distributed to 2.5 million peasant farmers. The land reform program, through the transfer of land from the conservative and generally absentee landlords to independent peasant farmers, established the basis for substantial improvement and high growth in Iranian agriculture. The economic motivation created by land reform in 1962 resulted in an increase of agricultural production. It rose from \$1 billion annually, a level at which it had stagnated for a period of 5 years prior to land reform, to \$1.7 billion in 1972.

The government has undertaken an ambitious irrigation development program. Twelve storage dams with a capacity to supply controlled water flows for 774,000 hectares have been constructed. Due to delays in the construction of irrigation and drainage systems below the dams, only 100,000 hectares of new land were actually irrigated by 1976. The construction of an additional six storage dams with capacity to irrigate 194,800 hectares was underway in 1976. The Government is also planning the construction of six more storage dams which will add 120,722 hectares of irrigated land. The Government plans to dig 1,000 deep wells annually. Total expenditures on irrigation for the Fifth Plan will amount to \$1.6 billion. By 1978 Iran should have over 4 million hectares of irrigated land.

Another important trend since 1962 has been the substantial migration of Iranians from rural to urban areas. This migration accelerated during the 1970's when the rapid growth in the Iranian economy



*Irrigation has opened large areas to cultivation. Almost 4 million hectares of cropland are irrigated.*

created a large number of job opportunities in industry and construction projects in urban areas. The migration resulted in a growing shortage of farm labor and rising wages in many agricultural area. In certain areas, daily wages for unskilled farm labor had increased from \$1–\$1.30 in 1973 to \$2.85–\$4.25 in 1976. The most severely hit areas were Marv Dasht, Khuzist, and Gorgan. Rising wage levels and non-availability of labor have forced many agricultural projects and farmers to further mechanize their operations.

One of the most important developments in Iran's economy during the mid-1970's was the growing imbalance between food demand and supply. The rapid growth of Iran's oil revenues, national income, and disposable family income created an annual 9% growth rate in the demand for food. This growth in demand for various types of food products ranges from 3.2% for wheat to 14.2% for poultry annually in the mid-1970's. Iran's ability to produce food has failed to keep pace with this rising demand. In the mid-1970's the annual growth rate in food production averaged only 4%. The imbalance between demand and supply has created a widening "food gap" which has been closed by massive increases in imports of foodstuffs (see table 7). In 1976, Iran was importing 75% of its soybean, oilseed cake, and fishmeal protein requirements and 50% of its corn requirements. By 1975, Iran's annual import bill,



**Table 7.—Iran: Quantity and Value of Agricultural Imports, 1975 and Exports, 1975**

Commodity Groups	Imports		Exports	
	Quantity (metric tons)	Value (Thousands of U.S. Dollars) <sup>1</sup>	Quantity (metric tons)	Value (Thousands of U.S. Dollars) <sup>1</sup>
Live Animals .....	53,221.5	55,089.9	752.7	669.2
Meat and Offals .....	63,445.9	96,413.1		
Fishery products, fresh .....	551.9	1,019.4	4,323.7	3,273.1
Dairy, poultry products, honey .....	53,846.3	79,673.9	123.5	43.7
Other animal products .....	12.7	41.2	1,309.9	65,600.1
Nursey products, flowers .....	335.1	1,487.0	198.1	39.8
Vegetables and tubers .....	4,659.1	989.5	33,217.5	4,417.9
Fruits and nuts .....	270,628.9	93,057.4	102,466.4	61,194.0
Coffee, tea and condiments .....	16,540.3	29,860.7	6,514.2	6,042.8
Grains and cereals .....	1,808,521.1	494,167.4	3,031.3	1,218.9
Milling products, malt, starch .....	38,392.7	17,289.0	873.5	173.0
Oil seeds planting seeds and Medicinal Plants .....	8,021.9	6,498.1	29,122.5	4,807.5
Vegetable gums, dyes, etc. ....	465.9	815.5	4,127.6	6,365.0
Weaving and brush fibers .....	31.3	87.9	310.1	16.2
Animal & vegetable fats and oils .....	260,815.1	311,636.5	836.4	513.7
Meat and fish preparations .....	375.4	701.4	403.3	6,718.7
Sugar and products .....	541,705.8	449,382.0	16,079.8	2,599.8
Cocoa and products .....	918.6	2,123.0	6.0	7.3
Cereal and starch preparations .....	6,138.2	10,514.1	2,471.7	3,111.5
Fruit and vegetable preparations .....	1,488.2	1,011.9	98.2	51.2
Miscellaneous edible prep. ....	2,064.3	11,370.8	436.8	225.2
Beverages and spirits .....	2,137.3	3,170.5	57.7	21.7
Protein meal and mill by-prod. ....	47,894.1	15,429.8	65.0	18.7
Tobacco .....	3,738.9	25,975.8	287.3	578.2
Totals .....	3,185,950.5	1,707,805.5	207,113.2	167,707.2

<sup>1</sup> Exchange rate: 1.00 U.S. \$=69.70 Rials.

Source: Official Iranian trade statistics.

which included virtually every major food product, had risen to \$1.7 billion compared with \$75 million for food imports in 1967. Further increased expenditures on food imports will consume a significant portion of Iran's foreign exchange and act as a constraint on its economic development plans.

## Government Agricultural Development Plan

The priority given agriculture in the Fifth Plan reflects the awareness by government planners of the critical role that agriculture will play in Iran's future economic development and the urgent need to expand agricultural production. The Fifth Plan's original target of an annual 5.5% agricultural growth was increased to 7% in 1974. The Government plans to achieve this 7% growth by a combination of large investment expenditure and institutional changes. Total public investment planned for agriculture during the Fifth Plan is \$5.3 billion compared to \$963 million during the Fourth Plan (see table 8). Actual expenditures for development amount to \$4.4 billion. The public and private sector are expected to supply \$2.5 billion and \$1.9 billion respectively. Of the private sector's capital investment, \$900 million is to come from private savings and \$1 billion from government bank loans (see table 9 and figure 1).

In 1976 the development banks were facing difficulties with their agricultural loan programs. Some of the money which was loaned by these banks for

**Table 8.—Iran: Total Public Funds Allocated for Agriculture During the Fifth Plan (1973/74–1977/78)**

(in millions of U.S. Dollars)<sup>1</sup>

Conservation of Natural Resources .....	477.0
Agri-business Development Projects .....	564.7
Agricultural Production .....	481.5
Livestock production .....	638.1
Agriculture and Livestock Service .....	699.6
Marketing .....	412.3
Credit .....	1,044.8
Farm Corporations and Cooperatives .....	720.0
Land Reform .....	80.0
Research .....	229.0
Administration .....	125.9
Total .....	5,472.9

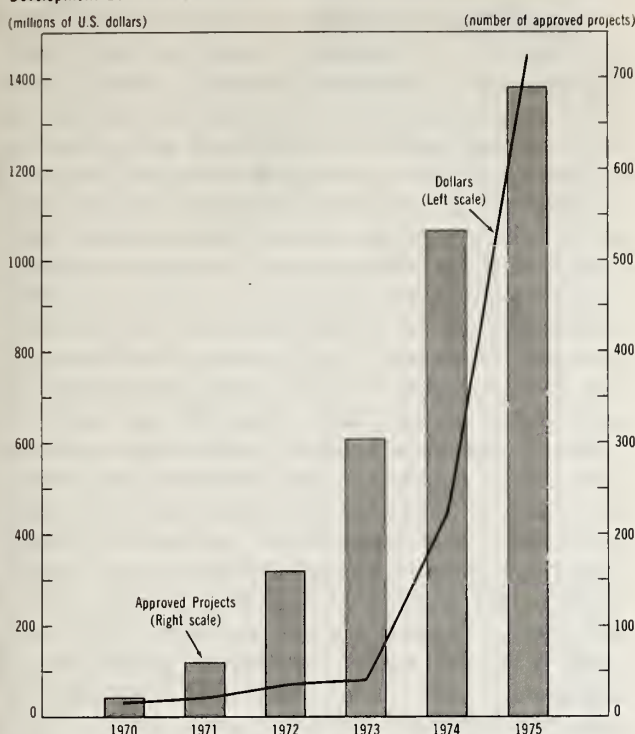
<sup>1</sup> Exchange rate: 1.00 U.S. \$=67.50 Rials. Figures may not add due to rounding.

Source: Plan and Budget Organization.

agricultural projects was directed by the recipients into higher yielding investments. In addition, the banks tended to prefer large projects and required that the title to lands be absolutely clear. These actions severely limited the number of qualified applicants. The Government then initiated several changes in the loan program to increase the number of applicants who could qualify for loans.

The Ministry of Agriculture announced in 1975 that Iran would strive to achieve an 80% self-sufficiency in food supply within 15 years. During 1975, the country produced approximately 78% of its total food requirements. Thus, given projected growth in demand and supply of agricultural products, it

**Figure 1**  
Iran: Number and Total Capitalization of Projects approved by the Agricultural Development Bank of Iran



Source: Agricultural Development Bank of Iran.

**Table 9.—Iran: Projects Granted Loans by the Agricultural Development Bank in 1975**

Type of Activity	Number of Projects	Loan Amount (in millions of U.S. dollars)
Cultivation and Sheep raising .....	277	51.3
Poultry farms .....	89	103.0
Orchards .....	157	29.4
Dairy Farms .....	59	31.9
Agri-business .....	19	320.8
Agricultural Services .....	7	12.1
Distribution and Marketing .....	12	70.5
Industries Relative to Agriculture .....	62	75.8
<b>Total .....</b>	<b>682</b>	<b>694.8</b>

Source: Agricultural Development Bank of Iran.

would appear that the 80% self-sufficiency goal by 1990 is overly ambitious. In fact, in 1976–1977 top government planners were engaged in an important debate over whether Iran should strive for self-sufficiency in basic food commodities such as wheat, rice, and sugar or whether the country should aim for self-sufficiency or near self-sufficiency in protein requirements supplied by red meat, poultry, and dairy products.

A report prepared for the Government in 1975 by Bookers Agricultural and Technical Services Limited of Britain, entitled *The National Cropping Plan*, recommends that Iran pursue a policy of self-sufficiency in staple commodities such as wheat, rice,

oilseeds, sugar, and fruits and vegetables rather than look for self-sufficiency in animal protein. The report projects that, given the country's resource limitations, self-sufficiency in staple products by 1992 would be accompanied by no greater than a 40% self-sufficiency in red meat. In contrast a cropping program which aimed at near self-sufficiency in animal protein would require the use of 70% of irrigated hectare for the production of feed and fodder crops. Iran would be required to import all of its wheat for human consumption, 95% of its oilseeds, 45% of its sugar, and 34% of its rice. The government will most likely use the Booker's cropping plan as basic guidelines for crop planning during the 1976–1986 period.

In addition to the credit and institutional arrangements associated with the Fifth Plan, the Iranian Government has instituted an array of policies and programs to encourage investment in agriculture. An extremely significant policy shift in the mid-1970's resulted in substantial increases in guaranteed prices of agricultural commodities. The 1976 support prices were enough to return a reasonable profit for most crops given good farm management. The government also supported the price paid to livestock producers. The official price for red meat was \$1.06 per kilogram live weight basis, but during the fall of 1976 the municipal slaughter house in Tehran was paying up to \$1.42 per kilogram live weight for sheep and \$1.13 per kilogram live weight for beef. The Ministry of Agriculture maintains that the official livestock prices guarantee a minimum rate of return of 20% for livestock projects. However, in 1976, a group of foreign investors decided not to invest in a cattle feedlot because their feasibility study indicated less than a 5% rate of return.

During the Fifth Plan period, the Government's goal was the importation of 200,000 dairy breeding animals by the private sector under a dairy development program. This program provides a grant to dairy farmers to cover the cost of transporting the animals and a 2% loan to finance their purchase. From the inception of the program to the end of 1976, approximately 32,000 animals had been imported. Annual imports during the late 1970's will probably range between 15,000 to 20,000 head. During those years 75 to 100 dairy farms, with an average herd size of 300 head, are expected to begin operations. Thus, Iran's improved dairy herd under modern management will expand from 45,000 animals in 1976 to 150,000 animals in 1980.

During the late 1960's and early 1970's the poultry industry attracted large amounts of private capital. A 1976 increase in the government's producer price for broilers from \$1.04 to \$1.21 per kilo live weight will assure an after tax return of 30% or more for well managed broiler operations. ADDBI



was allocating 16% to 18% of its total resources to the financing of large scale poultry projects in 1976.

Four new 1 million bird operations are scheduled to begin production in 1977. Moreover, in mid-1976 there were 25 approved projects each with annual production of between 500,000 and one million birds. In the late 1970's approximately 100 new projects with average annual capacity of 700,000 broilers should begin operations, doubling the 1976 production level of 11 million layers. The completion of layer projects under construction in 1976 will increase capacity to 15 million layers by the end of 1977.

The Extension Division of the Ministry of Agriculture is implementing yield improvement programs for wheat, rice, corn, forage crops, oilseeds, and potatoes. The objective is a rapid expansion in the hectareage of various crops by the use of improved seed varieties and mechanization. The program supplies high yielding seed and fertilizers to farmers at discounts of 20% below market prices. In addition, the program provides short term credit of up to \$42.50 per hectare for the purchase of farm machinery. The Ministry also plans to provide the full cost of insect control to farms of less than 100 hectares. In 1976, approximately 1 million hectares of crops were covered by the yield improvement program.

In 1975, the Government established a grant and loan program to finance on-farm infrastructural investments such as land levelling, irrigation systems, and wells. The basic objective of the program is to make investment in agriculture more competitive with investment in industry. An additional incentive to investment in agriculture is a 10-year tax exemption on profits from agricultural projects.

A basic objective of Iran's rural development strategy is the equalization of rural and urban income levels. A rise in rural family incomes to urban levels would require an increase in average farm size from the 1976 average of 2.8 hectares to a minimum of 12 hectares. A consolidation of farms to reach this minimum implies a 65% reduction in the number of peasant farmers.

An important aspect of the Government's agricultural plans is the policy of expanding the size of crop and livestock production units. The rapid growth of public and private agribusinesses, meat and dairy complexes, farm corporations, and production cooperatives is central to the Fifth Plan's agricultural strategy. The Government projected that by the end of the Fifth Plan, 30% of the targeted 4.1 million irrigated hectares would be farmed by large scale units. However, due to the slowdown in agribusiness development and the reduction in government budgets for farm corporations, the original hectareage target will not be achieved. It is projected

that approximately 700,000 or 17% of irrigated hectareage will be farmed by large units in 1978.

**Agribusiness Investment.**—During the early 1970's the Ministry of Agriculture expanded the concept of agribusiness to include a wide range of field crop, livestock production and processing complexes. Foreign investors signed letters of intent agreements for 50–60 agribusiness projects. By 1976, the Ministry of Agriculture announced that 800 agribusiness projects had been approved or were under consideration (see list at end of chapter). The amount of land to be farmed by these projects was to exceed 300,000 hectares by the end of the Fifth Plan. However, the poor performance of the agribusinesses in Khuzistan has created barriers to the rapid proliferation of private agribusiness projects. Most foreign investors who had expressed interest in agribusiness projects have given up their original intentions and a 1975 law which limits foreign equity participation to 25% of agricultural companies has further discouraged them. Moreover, Iranian investors, despite assurances by the Ministry of Agriculture of rates of return on agribusiness projects of 20 to 25%, continue to believe that investment in agribusiness is less attractive and more risky than investment in industrial projects.

As of early 1977 the status of many of the approved agribusiness investments was uncertain. Many projects had been deferred. Even in the case of projects for which financing had been obtained, it often appeared that funds had at least temporarily been channeled into ventures which guaranteed a higher rate of return. By 1975, 38 private agribusiness projects had been organized; however, only 22 of these projects were in operation, and only a few of these had fully developed their allotted acreage. By the end of the Fifth Plan (1978) only about 80,000 hectares will be farmed by the agribusiness companies and although it is difficult to project, perhaps 100,000 hectares will be cultivated by these firms in 1980.

## GROWTH PROSPECTS

The target established for growth of agricultural production during the Fifth Plan is 7% per annum. It is made up of a growth rate of 5.6% for crop production and 8.3% for livestock production. The actual annual growth rate of Iran's agricultural production during 1963 to 1973 was 3.6%. The growth rate during 1973 to 1975 was approximately 4% per annum. Thus, the target of 7% for the Fifth Plan period appears to be overly ambitious.

Significant increases in yields cannot be achieved in a period as short as 5 years by the use of adapted and improved crop varieties or better farm manage-

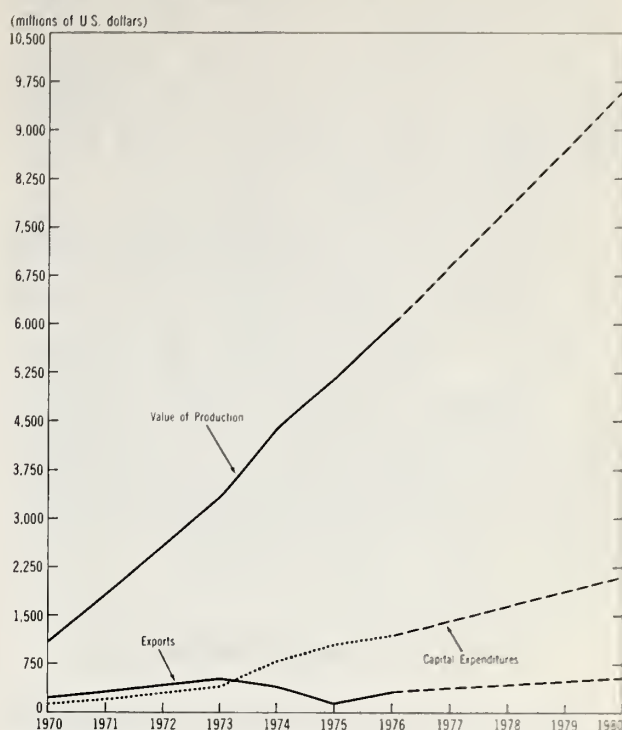
ment practices alone. Therefore new investment to expand the hectares under cultivation and increase yields through more irrigation and mechanization will be of paramount importance.

To sustain a growth rate of 7% in agricultural production, a higher level of investment than that planned by the Government will be required. It is estimated that by 1980 an annual investment of \$3.5 billion will be needed. If the relative proportions of government, banking, and private investment remain constant through 1980, they would reach \$1.1 billion, \$1.5 billion and \$993 million respectively. Total planned government expenditures on fixed investment for agriculture during the Fifth Plan are \$2.5 billion, or an average annual investment of \$511 million. Thus, the \$3.5 billion in 1980 to achieve a growth rate of 7% would involve a substantial increase in the Government's investment program. ADBI's share of the \$1.5 billion to be supplied by the banking sector would be approximately \$1 billion. It is unlikely that ADBI could develop or administer a lending program four times larger than its 1976 portfolio by 1980. Most importantly, private farm investment most likely will not expand to \$993 million by that year. From 1972 through 1976, private farm investment fluctuated between \$213 million and \$284 million per year. Uncertainty over land tenure patterns, the high level of risk of investment in agriculture, and a maximum rate of return on agricultural investment of 15 to 20% (compared with 30% or more on industrial projects) should continue to inhibit investment. Thus, there will be inadequate private and public investment funds to finance a 7% growth rate. It is estimated that actual capital expenditures will not grow faster than 15% per annum and will rise from \$1 billion in 1975 to \$2.1 billion in 1980 (see figure 2).

In addition to the shortage of investment, an extremely significant constraint on Iran's agricultural growth during the late 1970's and early 1980's will be a shortage of competent farm management. There are 10 universities in Iran with degree programs in agriculture and veterinary sciences graduating 700 to 800 students per year. There are also 19 vocational high schools operated by the Ministry of Agriculture which graduate 1,000 students per year, and ADBI is planning to develop an institute to train farm managers. Despite the efforts of these institutions, a severe shortage of general farm managers, equipment operators, mechanics, animal husbandrymen, and research personnel will continue to exist.

Production of poultry, milk, fruits, vegetables and sugar should grow most rapidly. Projected annual growth rates for broiler and egg production during the 1977-1981 period are 11% and 8% respectively. This growth in poultry production will result

Figure 2  
Iran: AgroIndustry Growth Indicators



Source: Central Bank of Iran & Official Iranian Trade Statistics.

from the high demand for white meat and eggs, the relative ease of expanding poultry production, and government support for the production of white meat. By 1980, 20 million layers will be producing eggs. The major constraint on the growth of the Iranian poultry industry is the shortage of feed.

The projected growth of 7% in milk production assumes that the rapid expansion of dairy operations in the mid-1970's will continue. The growth in dairy operations will be stimulated by the Government's effective support price of \$.285 per liter of milk and the Government's grant and loan program for the importation of breeding stock.

Production of fruit and vegetables is expected to grow at 9% annually due to increased requirements of the rapidly expanding canning industry, and larger summer and winter crops of melons, tomatoes, and cucumbers for the fresh food market. Moreover, extensive planting of deciduous orchards and citrus orchards during the early 1970's will give maximum yields during the last half of the decade.

Cotton and red meat production will have the slowest growth from 1976 to 1980. Cotton hectareage is expected to remain at 1976 levels or fall slightly, due to projected 1 to 2% growth in cotton demand worldwide and consequent low prices for this crop. Dry range conditions, restrictions of grazing rights on national rangelands, and high prices offered for the purchase of ewes for fattening and slaughtering by several government livestock projects will result



in low growth in the national lamb crop during the late 1970's. The large-scale private sheep and cattle feedlots envisioned by the Government are not expected to materialize by 1980. Low profitability of such projects is caused by the cost and shortage of feeds and lack of national experimental breeding and feeding research programs to improve the productivity of Iran's sheep and cattle.

Given the investment, management, and manpower constraints on agricultural growth, the annual growth rate during the period from 1975 to 1980 will more likely be 5.5% than 7%. This annual 5.5% growth projection assumes that priority in government policies will be given to staple crops such as wheat, rice, sugar, and oilseeds. If, however, Iran adopts an aggressive strategy of expanding livestock production, the high management requirements, greater use of the country's limited water resources and the relative inefficiency of animal production would result in a growth rate of less than 5%.

## CAPITAL GOODS MARKET

Sales of agricultural equipment in Iran grew at an average annual rate of close to 50% from 1973 to 1975, rising from \$77.3 million to \$173 million (see table 10). Sales should continue to grow during the following 5 year period, but at a more modest 12% annual rate, rising to over \$300 million in 1980. The demand for capital goods is expected to expand faster than the growth of agricultural production because Iranian farm operations will become more mechanized. Meanwhile, domestic production of agricultural equipment is growing.

### Imports

Imports accounted for just under one-half of total 1975 agricultural equipment sales in Iran; this is expected to decline to about 40% by 1980 as domestic manufacturing increases. European agricultural equipment suppliers have historically dominated the market. In 1975 European sources accounted for 55% of total imports of agricultural equipment with West German, British, and Italian suppliers having the highest sales levels. Israeli suppliers accounted for 23% of total equipment imports, dominating the market for plows, discs, cultivators, and irrigation supplies. United States suppliers' share of agricultural equipment imports in 1975 was almost 17%. U.S. companies have a strong market position in such equipment categories as combine harvesters, hay balers, and high horsepower tractors.

While approximately \$21 million of the value of domestically manufactured agricultural equipment in

**Table 10.—Iran: Size of the Market for Agricultural Equipment**

(thousands of U.S. dollars)

	1973	1974	1975	(Estimated) 1976	1980
<b>CULTIVATION AND PREPARATION MACHINERY AND EQUIPMENT</b>					
Domestic Production .	13,209	21,654	22,627	24,525	37,500
Imports .....					
United States .....	611	1,061	2,647	3,030	4,800
France .....	599	210	1,526	—	—
United Kingdom ..	695	848	1,911	—	—
Israel .....	8,217	12,328	18,949	—	—
West Germany ....	865	929	2,198	—	—
Others .....	1,026	2,537	2,465	—	—
Total .....	12,013	17,913	29,696	33,675	61,000
Total Market .....	25,222	39,567	52,323	58,200	98,500
<b>DAIRY FARM EQUIPMENT</b>					
Domestic Production .	259	307	555	725	1,500
Imports .....					
United States .....	14	100	487	570	1,170
Denmark .....	110	347	1,832	—	—
West Germany ....	15	199	268	—	—
United Kingdom ..	134	455	230	—	—
France .....	11	7	163	—	—
Others .....	4	561	268	—	—
Total .....	288	1,669	3,248	3,825	7,800
Total Market .....	547	1,976	3,803	4,550	9,300
<b>POULTRY RAISING EQUIPMENT</b>					
Domestic Production .	2,137	2,813	4,599	5,500	11,000
Imports .....					
United States .....	402 <sup>1</sup>	249	584	650	1,000
Netherlands .....	3,197	3,105	3,249	—	—
Italy .....	704 <sup>1</sup>	176	1,314	—	—
West Germany ....	818 <sup>1</sup>	717	922	—	—
Others .....	1,586 <sup>1</sup>	1,669	1,323	—	—
Total .....	6,707	5,916	7,392	8,200	12,500
Total Market .....	8,844	8,729	11,991	13,700	23,500
<b>OTHER ANIMAL HUSBANDRY EQUIPMENT</b>					
Domestic Production .	43	117	220	255	300
Imports .....					
United States .....	135 <sup>1</sup>	278	73	75	100
West Germany ....	110 <sup>1</sup>	59	277	—	—
United Kingdom ..	127 <sup>1</sup>	190	219	—	—
Others .....	411	366	336	—	—
Total .....	792	893	905	945	1,300
Total Market .....	835	1,010	1,125	1,200	1,600
<b>AGRICULTURAL TRACTORS</b>					
Domestic Production .	27,510	46,003	57,270	66,400	118,000
Imports .....					
United States .....	3,468	6,061	5,606	4,800	4,500
United Kingdom ..	1,453	5,783	9,197	—	—
West Germany ....	273	2,723	5,839	—	—
Italy .....	305	410	3,825	—	—
Others .....	4,489	1,610	1,898	—	—
Total .....	9,988	16,587	26,365	26,100	20,500
Total Market .....	37,498	62,590	83,635	92,500	138,500
<b>HARVESTING AND ON-SITE CROP PROCESSING EQUIPMENT</b>					
Domestic Production .	460	2,518	5,710	7,125	22,500
Imports .....					
United States .....	1,138	1,792	4,119	4,515	4,620
West Germany ....	990	1,147	5,684	—	—
United Kingdom ..	442	418	1,385	—	—
Italy .....	384	185	912	—	—
Belgium/Luxembourg .....	102	280	858	—	—

**Table 10.—Iran: Size of the Market for Agricultural Equipment—Continued**

	1973	1974	1975	(Estimated)	
				1976	1980
France .....	93	391	485	—	—
Others .....	740	1,432	1,049	—	—
Total .....	3,889	5,645	14,492	16,125	16,500
Total Market .....	4,349	8,163	20,202	23,250	39,000
<b>MARKET SIZE</b>					
<b>TOTALS</b>					
Domestic Production ..	43,618	73,412	90,981	104,530	190,100
Imports .....					
United States .....	5,768	9,541	13,516	13,640	16,190
Israel .....	8,217	12,328	19,139	—	—
West Germany .....	3,080	5,774	15,188	—	—
United Kingdom ..	2,851	7,694	12,942	—	—
Others .....	13,761	13,286	21,563	—	—
Total .....	33,677	48,623	82,098	88,870	126,300
Total Market Size ....	77,295	122,503	173,079	193,400	310,400

<sup>1</sup> Estimated.

Source: United Nations, Organization for Economic Cooperation and Development, supplier country and official Iranian trade statistics; estimates based on trade interviews.

1975 represented imported parts, Iranian manufacturers are being required to raise the percentage of locally fabricated parts. Imports of parts should grow at approximately 10% per annum through 1980 but level off and begin to decline after that time.

Sales of certain types of equipment are projected to grow more rapidly than the estimated average 12 annual overall rise in sales. Dairy farm equipment sales are expected to grow at an average annual rate of 20% because of the build-up projected for Iran's commercial dairy herd. Sales should rise from \$3.8 million in 1975 to \$9.3 million in 1980. The large Danish share of imports of this equipment in 1975 was made up primarily of Swedish transshipments.

The projected growth in poultry equipment sales for broiler and layer operations is about 14% per year, rising from \$12 million in 1975 to \$23.5 million in 1980. Sales of automatic drinking systems and brooders should grow at about 17% per year, while projected sales of automatic laying batteries are expected to expand at close to 13% annually. Sales of small feedmills, grinders, and mixers should grow at 10% per year and sales of coolers, heaters, poultry manure driers and feed analysis equipment are expected to grow moderately at approximately 8% per year. Large sales by the Netherlands subsidiary of a U.S. manufacturer has resulted in the Netherlands being the leading supplying country of poultry equipment, accounting for nearly 50% of imports in 1973 through 1975. German companies sold 10–15% of poultry equipment imports. Competition has been increasing in this rapidly growing market. Both U.S. and Italian suppliers increased their sales in 1975, claiming 8% and 18% respectively of the \$7.4 million in value of imported equipment that year.

The average annual growth in sales of agricultural tractors in the 1975–80 period is expected to be about 10%, rising from \$83.6 million in 1975 to \$138 million in 1980. The most rapid growth is projected in sales of small tractors, but the greatest volume of sales is expected to be of medium-sized tractors (50–75 hp). Suppliers from the United Kingdom maintained a 35% share of sales of imported tractors during 1974 and 1975. The share of U.S. suppliers fell from 37% in 1974 to 21% in 1975. West German suppliers increased their share of imports from 16% in 1974 to 22% in 1975. Some of these fluctuations were due to sourcing shifts by multinational suppliers.

Sales of cultivating and land preparation equipment as well as harvesting equipment should grow at about 14% per annum through 1980 with sales of row-crop equipment, such as row-crop cultivators and planters, growing most rapidly at 18% and 19% per annum respectively. Grain combine sales are expected to grow at 13% annually and sales of hay-making equipment, such as mowers, rakes and balers should grow at 10% per year.

## Domestic Manufacturing

In 1976 there were eight major domestic manufacturers and assemblers of agricultural equipment, generally operating under licensing arrangements with foreign companies or as joint ventures between Iranians and foreign investors. These companies included three tractor assemblers, two power tiller assemblers, a poultry farm equipment supplier and various pump and cooler suppliers.

The manufacture of tractors in Iran began in 1967 when the Iranian and Romanian governments agreed to produce 45 hp and 65 hp Universal tractors. The production and sale of these tractors increased from 2,388 units in 1967 to 9,038 units in 1975 with Universal tractors accounting for 66% of total Iranian tractor sales in the latter year. They are assembled from partially knocked-down units. In 1976, local content of the Universal tractor was 14%. Since 1967, production of the Universal tractor has been protected by a restriction on the importation of tractors between 35 and 90 hp. The Iranian Tractor Manufacturing Company or ITMCO, also produces Romanian designed farm implements. In 1975, ITMCO produced 7,057 plows, 1603 disc harrows, 90 fertilizer spreaders, 238 seed drills, 780 dozer blades and 2,001 farm trailers. The total value of these implements was \$9.5 million.

Universal tractors and implements are marketed through the Agricultural Development Machinery Organization or ADMO, which sells through 56 local dealers. The rapid growth of Universal tractor sales was a result of their relatively low price and the



attractive financing terms provided by the ADMO. In 1975, the Universal 65 hp tractor sold for \$4,380, a price approximately 35% lower than the landed cost of imported tractors of equivalent horsepower. Operators, however, expressed considerable dissatisfaction with the Romanian tractors, including their heavy weight in comparison with their power, and frequent overheating.

In 1975, the Iranian Government granted a license to Massey-Ferguson Ltd. of Canada to produce tractors in the medium horsepower range. Massey-Ferguson plans to manufacture three models: the MF 135 (47 hp), the MF 165 (62 hp) and the MF 185 (75 hp). The Government plans to phase out the production of the Universal tractors over a 3 year period after the commencement of the production of Massey-Ferguson tractors. In 1975, Massey-Ferguson assembled approximately 500 units and had plans to build up production to 20,000 tractors by 1981. The company has agreed to achieve local content of 80% by the fifth year of production. Massey-Ferguson will also manufacture plows, discs, cultivators, seeders and a variety of other implements. The Massey-Ferguson tractors will be marketed, financed and serviced through dealers managed by a new company to be formed by ADMO, Massey-Ferguson, ADBT, IMDBI, and the rural co-operatives. The financing terms will be 20% down with a 5 year loan carrying a 6% interest rate to finance the balance.

In 1976, the Government licensed Deere & Co. (U.S.) as the exclusive manufacturer of tractors in the 75 to 145 horsepower range. Deere & Co. has operated a manufacturing plant in Iran (Sherkate Sahami Khass Iran—John Deere) since 1969. In 1975, Deere & Co. assembled 100 completely knocked-down (CKD) tractors and 85 CKD combine harvesters. Deere & Co. plans to expand the production of tractors rapidly to a level of 4,400 by 1981. Eventually, the company hopes to achieve 65% local content. Deere & Co. plans to produce 100 combines by 1981. In 1976 the Government extended the ban on tractor imports to 110 hp. and placed a ban on the importation of combine harvesters.

The Japanese companies Mitsubishi and Kubota assemble 7 hp. and 12 hp. hand-operated power tillers in Iran for rice cultivation. In 1975, Mitsubishi sold 6,000 of these tillers and Kubota sold 2,000. It is estimated that the market for these power tillers will expand to 11,000 units annually by 1980.

The Drip Irrigation Company, established in 1972 under license of the Netafim Company of Israel, has installed approximately 90 of the 2,900 hectares of drip irrigation in Iran. In 1975, the company established a subsidiary called the Irrigation Equipment Manufacturing Company. The company manufac-

tures polyethylene pipe for sprinkler and drip systems, filters and emitters. Its annual production capacity of 5,000 tons of polyethylene pipe is equivalent to approximately 15,000 hectares of drip irrigation installations.

The Peerless-Iran Corp. manufactures deep well turbine pumps under license of FMC Corp. of the United States. In 1975, Peerless-Iran produced 657 deep well turbine pumps ranging in size from 6 to 12 inches. The company estimates that production in 1976 will exceed 1,200 turbines. Peerless is the exclusive producers of pumps for the Government's deep well irrigation projects. In addition to Peerless, there are hundreds of small workshops in Iran which produce a total of approximately 2,000 pumps per year.

The Iran and German Manufacturing Company produces automatic chain feeding systems, coolers, heaters and layer cage systems for poultry operations. The company's products are competitive in both price and quality with most imported equipment. Its sales grew steadily during the mid-1970's despite shortages of local raw materials. The Zagross Company manufactures evaporation type coolers for dairy farms. The company's sales account for approximately 80% of the total market for dairy farm coolers. The company also produces 10 to 15 bulk tank trucks per year for dairy farms on a special order basis.

## MARKET OPPORTUNITIES

The agricultural capital goods market in Iran presents an array of opportunities for equipment sales during the late 1970's and early 1980's. The most rapidly growing requirements will be for dairy farm equipment. There are two important factors affecting the dairy farm equipment market. The first is the preference of Iranian dairymen for installing a relatively high number of milking stalls for a given herd size to assure short milking times. The second factor is the shortage of skilled dairy farm labor. These factors will force dairy farms to automate as much as possible within the limits of management constraints.

There will be excellent opportunities for sales of milking machines and bulk cooling systems. Herringbone milking systems account for more than 90% of total milking systems installed in the commercial dairies. The popularity of the herringbone layout will continue in the late 1970's and early 1980's. Automatic quarter take-off units and low line pipeline milking systems, neither of which is currently utilized in Iran, have strong market potential. In 1976 approximately 80% of the milk in Iran was transported from dairy to processing plants in cans. Thus,

a small but growing market exists for bulk milk trucks.

Because feeding and manure removal is done almost completely by hand, there will be limited opportunities for sales of automatic feeding and manure handling systems in the late 1970's.

There should be a strong demand for modern poultry equipment due to the large number of new broiler and layer projects and the expansion of existing operations. Use of tube and auger type feeding systems will grow more rapidly than automatic chain feeding systems (popular in the 1970's) due to their flexibility, high feeding efficiency, and lower price. The potential market for automatic cage systems for broilers, none of which were in operation in 1976, is not large due to their high cost per broiler house. A small market for egg grading equipment may materialize at the end of the 1970's. A few poultry projects have imported pre-fabricated wooden, aluminum, and galvanized steel housing systems. However, the market for imported, pre-fabricated housing systems will remain small during the 1977-1981 period due to the comparatively low cost of poultry housing built with local construction materials and the production of pre-fabricated housing in Iran.

The market for imported tractors will be limited to those types and sizes which are not locally manufactured. The number of medium-sized tractors, 50 to 75 hp, should increase from 9,700 units in 1975 to 11,200 units in 1980. Annual sales of tractors of more than 75 hp are expected to grow from 1,000 units in 1975 to 1,250 units in 1980. The land owned by farmers with less than 50 hectares is generally farmed in small parcels of 1 to 5 hectares. These small parcels of land cannot be mechanized with American or European type equipment unless they are consolidated, but the process of consolidation has been slow. Meanwhile, the migration of rural inhabitants to urban areas is creating a growing shortage of farm labor for activities such as land preparation, weeding, and harvesting. Thus, there exists a growing market for agricultural equipment which is small enough in size and power to be used economically on very small units of land. A significant market could develop for garden-type tractors and accessories suitable for commercial use.

Power tillers meet the needs of farmers with small plots in rice producing areas. Two items of equipment produced in Italy appear to be particularly adaptable to increasing productivity on small plots in non-rice areas. They were introduced in 1975. The motormower is a small, engine-powered rake which cuts alfalfa, wheat, and other grasses or forage crops. The reaper/binder cuts wheat and binds the cuts grass into a sheaf with a cord. It enables one man to harvest a crop equivalent to the hand harvest

of 15 to 20 men. In 1975 about 1,400 units of the motormowers and reaper/binders were sold; 1976 prices for these units were \$1,957 and \$2,766 respectively. Small scale equipment for other farm operations such as tillage, seeding, and cultivating will have a large market in Iran.

Requirements for the entire range of farm implements, such as tillage, planting, and cultivating equipment will grow rapidly during the late 1970's. Hectares of dryland wheat and barley under cultivation should increase substantially. An improvement in dryland farming practices and soil and water conservation measures will create a demand for chisel plows and press type grain drills. There will be good opportunities for sales of spraying equipment which will be purchased by the Ministry of Agriculture's Plan Protection Organization for the free spraying program for small farmers.

Prospects will be excellent for all types of sugar beet harvesting equipment including diggers, toppers, hay making equipment and combines. Farm corporations and large private farmers will consolidate their sugar beet fields and find it increasingly difficult to hire hand harvesting labor.

Although limited by the small field sizes and furrow irrigation systems in Gorgan, the main cotton growing area of Iran, the market for cotton harvesters is expected to be 15 to 20 units per year in 1980.

The results of commercial operations and the Government's experiments with modern irrigation systems will determine which systems are suitable to Iran's soil, climate, cropping, and management environment. The Ministry of Agriculture is conducting a variety of experiments with sprinkler and drip systems. In 1976, approximately 20,000 hectares of land were irrigated by hand-set sprinkler systems, 3,000 hectares were irrigated by travelling systems, and 2,800 hectares of orchards were under drippers. The most optimistic advocates of sprinkler irrigation estimate that 50,000 hectares of land will be sprinkler-irrigated by 1980. A more likely estimate would range from 30,000 to 35,000 hectares by 1980. The hectareage under drip irrigation will most likely grow to 5,000 to 6,000 hectares by 1980.

The potential for increased sales of farm trailers is nearly unlimited. A critical bottleneck on nearly every mechanized farm in Iran is the shortage of on-farm transport. In 1975, 4,000 trailers were sold and sales are expected to reach 15,000 units by 1980. The increase in the production of forage crops of hay and silage will create a new market for self-unloading forage trailers. The market for such specialized equipment should grow to 1,500-2,000 units by 1980. In 1976 the government banned the import of agricultural trailers. Thus the size of the potential market creates an attractive opportunity for



a foreign company with experience in trailer manufacture to establish a joint venture with Iranian investors for the local production of trailers.

On-farm grain handling and storage systems have a large potential market in Iran. In the mid-1970's the country's grain crop was still being unloaded from combines and bagged in the field; the bags of grain were then loaded onto dump trucks by hand. As the cost of labor rises, gravity grain boxes, grain elevators, conveyors, and suction systems to mechanically load grain into farm storage bins should have a substantial demand. While there was virtually no market for bulk grain handling and storage systems in 1976, by 1980 the sales of such systems could exceed \$2 million. Such a growth in sales of grain handling systems would require an aggressive marketing program to familiarize the large grain farmers with the advantages and techniques of such systems.

There will be a small market for feedlot equipment such as automated feeding and manure handling systems although growth will remain limited due to the slow pace of development projected for sheep and cattle feedlots.

**Agricultural Services.**—The major need in Iran for management services has been for the preparation of feasibility and engineering studies for agricultural projects. In 1976, there were 35 consulting firms, Iranian and foreign, involved in the preparation of feasibility studies and technical engineering plans for agricultural projects. During 1976, the general cutback in government development expenditures caused the budget for feasibility studies and engineering plans to be reduced. Industry sources believe that the cutbacks will continue through the late 1970's and opportunities for involvement of new foreign consulting firms will be limited.

A sizeable market will exist, however, for farm management services. The shortage of farm management is a critical limitation in the development of Iranian agriculture. Only a few firms offer limited farm management services.

An extensive market also exists for specific farm services such as the development and implementation of pest control programs, equipment maintenance programs, dairy farm feeding and breeding programs, and accounting systems. The introduction of programs for the efficient management of farm machinery on medium and large farms is particularly important. The wide range of farm services which are required to support modern farming are not available in Iran. The only companies providing support services to farmers in the mid-1970's were several farm chemical firms which supplied pest monitoring and control systems for cotton farmers on a contract basis. A large potential market exists for the transfer of modern agricultural technology and

farm practices to Iran, but the technology and practices must be carefully selected and adapted to fit the needs and realities of the country's agricultural environment.

## MARKETING ENVIRONMENT

### Buyers Universe

There are a large number and variety of purchasers of agricultural machinery in Iran. The largest single purchaser is the Agricultural Development Machinery Organization, which resells to farmers throughout Iran. In 1976 there were 27 other fairly large purchasers of agricultural equipment including four private agribusinesses, four government agribusinesses, seven government agencies and ten universities. Together, these purchasers accounted for approximately 9% of the sales of agricultural machinery in 1975. About 18% of 1975 sales were made to 88 farm corporations, 34 production cooperatives and approximately 26 medium-sized agribusinesses. Although individual purchases of equipment by Iran's 500,000 commercial farmers are not large, in 1975 they bought approximately 50% of the equipment sold. The remaining 23% was bought by small farmers and by entrepreneurs who provide cultivating and harvesting services to farmers.

**The Agricultural Development Machinery Organization.**—The Agricultural Development Machinery Organization (ADMO) purchases Iranian—assembled Romanian tractors and implements from the Iran Tractor Manufacturing Co. (ITMCO). In the future the company will purchase the locally produced Massey-Ferguson and John Deere equipment and distribute it to farmers through a group of dealers. ADMO has also placed large orders for equipment from international suppliers at times when the demand in Iran exceeded the supply capability of domestic manufacturers. In 1975, Massey-Ferguson won a tender bid from ADMO for 500 tractors.

**Private Agribusinesses.**—The managers of the private agribusiness companies in Khuzistan are generally the most experienced buyers of farm equipment in Iran. These managers attempt to make equipment purchases on the basis of economic considerations and the degree to which a piece of equipment fits the existing machinery complement and cropping program. The agribusiness companies represent a small market for advanced agricultural equipment but they constitute a demonstration project for modern farm machinery to a large number of Iranian farmers.

The Khuzistan Agricultural Services Company, formed by the Government in 1976, will eventually

represent a considerable market for the sale of a variety of equipment such as large field sprayers, farm trailers, and irrigation equipment. In 1976 the company was considering the purchase of Grumman Corporation's Agcat airplanes for the aerial application of herbicides, pesticides, and fertilizers.

**Government Agribusinesses.** — The government agribusiness projects also represent a small market for a wide range of modern farm equipment. The equipment inventories of the Moghan Agro-Industry and Sefid Rud projects and the Karoun and Haft Tappeh sugar cane projects are as impressive as those of the private agribusiness projects. Government projects are required to purchase equipment according to the rules and regulations of the government's tender system. The selection of equipment under this system is on the basis of low bid, according to equipment and performance specifications. Thus, the quality of equipment and sales presentation are often not critical to making the sale.

**Other Government Purchasers.**—An array of other government organizations purchase equipment for their own operations or for lease to farmers. These organizations are: The Department of Agricultural Engineering, the Plant Protection Organization, the Soil Institute, the Seed and Plant Improvement Institute, the Oilseed Cultivation Company, the Forest and Range-land Organization, the Extension Department, and the 10 agricultural universities and 19 agricultural technical schools. These organizations make sporadic purchases on a tender basis.

**Farm Corporations and Production Cooperatives.** —The farm corporations and production cooperatives represent a considerable market for farm machinery. In general, the purchase of farm equipment by the farm corporations has been less aggressive and more prudent than the purchases made by several of the agribusiness companies. Most major equipment purchase decisions are made by the Department of Technical Assistance of the Ministry of Agriculture. The department employs several experts in farm machinery who oversee the development of machinery programs for the farm corporations. These experts influence purchase decisions, but capable and aggressive managers of individual farm corporations are given freedom to make equipment purchases directly from dealers.

The purchase decisions of the farm corporations are generally not subject to the government's tender regulations. Thus, both farm managers and the personnel of the technical departments compare equipment and buy on a price and quality basis. During the 1974–1976 period large sales of John Deere tractors, combines, and sugar beet harvesters were made to the farm corporations.

Purchase decisions for dairy farm and poultry operations and medium-sized private agribusinesses are generally made by the owners of these projects. In a few cases, decisions are made by consulting firms or the technical managers of the projects. The owner/decision makers are rarely sophisticated or knowledgeable about the range of available equipment. Most purchases are made on the basis of observation of the machinery used by existing neighboring operations.

**Commercial Farmers.**—Commercial farmers in Iran have traditionally operated at a low level of mechanization. However, if ADBI's shift in lending policy provides a substantial volume of funds to the commercial farmers, they could become a highly lucrative market for equipment supplies. The 500,000 farmers in this group are scattered throughout Iran and are difficult to reach. Commercial farmers generally drive hard bargains and get the maximum use of farm machinery. Thus, a successful marketing effort to these farmers would require a widespread dealership system with a corps of professional salesmen capable of demonstrating the equipment's usefulness and economic viability.

**The Role of Consulting Firms.**—The advice of consulting firms is frequently an important factor in the purchase of agricultural equipment. In the mid-1970's a large number of foreign firms were conducting management and engineering studies for agricultural projects. A partial list of these firms is Agriconsult (Sweden), Bookers and Huntings (U.K.), Development and Resources Company (U.S.), FMC Corp. (U.S.), Louis Berger (U.S.), McGowan and Associates (Australia), SCET (France), Six Alex Gulf (U.K.) and Hawaiian Agronomics (U.S.), which is involved in the general management of International Agrobusiness Co. in Khuzistan and technical management of the Dashte Moghan project. The Food and Agriculture Organization (FAO) of the United Nations has been involved in Iran. FAO agricultural experts work in training programs and as technical advisers to the Ministry of Agriculture.

In 1976 a new company was being organized to provide farm services to the agribusinesses. The company will be owned by the agribusiness companies, the Ahvaz Sugar Beet and Refinery Company, and ADBI and will provide services such as aerial and ground applications of fertilizers; herbicides and pesticides; crop hauling, land levelling and the leasing of sprinkler-irrigation systems. In addition, ADBI is organizing a technical and scientific management corps, the managers and services of which will be jointly used by the agribusiness companies. The corps will employ an accountant to standardize the cost accounting systems of the com-



panies, an engineer to supervise land levelling, a plant pathologist, a veterinarian, a marketing and procurement expert, and a machinery expert.

## Foreign Suppliers Universe

There are some 50 foreign firms selling agricultural equipment in Iran. Most major manufacturers of agricultural equipment are represented in Iran or have their own local sales and service firms. Equipment is generally supplied directly from plants in the supplier firm's country but some equipment, such as Big Dutchman poultry equipment which is manufactured by U.S. Industries, Inc.'s Netherlands-based subsidiary Big Dutchman Nederland N.V., is manufactured in offshoot plants of multinational firms, and delivery is made from these locations.

The most successful foreign suppliers of tractors have been Massey-Ferguson and John Deere, both of which also assemble tractors in Iran. Other foreign suppliers have been forced to work around import restrictions. The J.I. Case Co., division of Tenneco, Inc. (U.S.) has been selling high horsepower (above 120 hp) tractors, mainly to the large agribusiness projects. Mitsubishi Co. of Japan, on the other hand, has sold smaller garden tractors (15 to 35 hp).

Farm implement suppliers have less of a presence in Iran than the tractor companies and generally depend upon periodic visits of sales personnel to local agents. The strong projected growth and open import conditions of most lines of implements would seem to warrant a more aggressive strategy. European, Israeli, and Japanese suppliers tend to have strong market positions for most agricultural equipment. The only equipment subsector in which U.S. companies have a strong position is harvesting equipment, viz. combines and haymaking equipment. The Israeli implement companies generally are the most aggressive marketers with frequent visits of company sales personnel and strong local dealers.

One of the few farm equipment companies to establish a local office in Iran is Alfa-Laval of Sweden. The office manages the company's sales, installation, parts inventory, and after-sales service operations. Office personnel include several Swedes from Alfa-Laval and four or five Iranians in technical and managerial positions.

Alfa-Laval, which ships equipment from Denmark, has dominated the dairy farm equipment market for many years, supplying 70% of the market for dairy milking systems. However, Alfa-Laval may have difficulty maintaining its dominant market position. Several of the larger dairy farm operators prefer the performance of the milking systems of Fulwood Company of England. Moreover, despite the comparatively outstanding after-sales service of Alfa-Laval, many dairy farmers complain that the

company does not provide for regular service calls, which are important for equipment with such intensive daily usage. Thus, the Swedish firm's leading position could be challenged by a supplier of dairy farm equipment who developed an aggressive market organization, provided full service and sold milking systems properly suited to Iran's dairy operations.

Big Dutchman has dominated the sales of poultry equipment for many years. However, during the mid-1970's the company's market share eroded from approximately 80% to 60%. Big Dutchman's share of the market for automatic feeding systems fell from 95% to 60%. Its major competitor for sales of feeding systems is Chore Time Equipment, Inc. of the United States. The Chore Time auger feeding system, which many consider more economical and efficient than Big Dutchman's chain system, had captured 25% of the sales of feeding systems by 1976. Sales of domestically produced chain feeding systems have also grown. Big Dutchman's sales of automated cage systems still accounted for over 60% of the total market for these systems in 1975. The rapid growth of the Iranian broiler industry has encouraged many of Big Dutchman's competitors, such as Chore Time, Lacco of Holland, Faco of Italy and Plasson of Israel, to enter the market and it seems inevitable that Big Dutchman would lose a portion of its market share. However, the company is introducing a variety of new products such as gas brooders, aerosol air coolers, egg coolers, and manure drying systems. Big Dutchman's excellent reputation, broad product line, and service will help maintain its market leadership. There is only a small market for poultry housing, but in 1976 the government turkey project near Qazvin was importing a modern, wood-fabricated housing system from Hailow Bros. of Britain.

Rain Sprinklers, Inc. of the United States has accounted for 70% of the sales of sprinklers in Iran. The company's dominant position is a result of the strong position of its local dealer, who has made approximately 80% of the total sprinkler irrigation equipment sales in Iran. The Drip Irrigation Company, which produces and markets drip systems under license from Netafim Company of Israel, has sold over 90% of the drip irrigation equipment in Iran. Drip Irrigation Company gained its large share of the market by being the first company to market drip systems in Iran and by providing good technical service and training for its customers. The company utilizes slides, films, manuals and demonstrations in its farmer training program.

In addition to their strong position in the market for tractors, Massey-Ferguson and John Deere have good sales of agricultural equipment; and because of their strong marketing organizations it is expected

that their market share will increase. John Deere has plans to manufacture some equipment domestically, particularly combine harvesters, sugar beet harvesters, and haymaking equipment. In addition to manufacturing both tractors and implements, Massey-Ferguson has begun to market a variety of special equipment, and has been aggressively attempting to introduce special grain drills, rotary slashers and chisel plows for dryland wheat and barley crops. Massey-Ferguson works with the Seeds Research Institute, the Ministry of Agriculture and the Extension Service to demonstrate the equipment to farmers. Massey-Ferguson is also marketing special sugar cane planting, cultivating and harvesting equipment to the sugar cane projects in Khuzistan.

Small motormowers and reaper/binders were introduced into Iran in 1974, and are supplied by three small Italian companies, Nibli Bruno & Figli, S.p.A., Bedoni, S.p.A., and BCS, S.p.A. Sales of this equipment have grown rapidly because it is well adapted to meet the needs of farmers with small plots of land. These Italian firms expect to increase their sales from 1,400 units in 1975 to over 7,000 units by 1980.

## Marketing Factors

Most imported agricultural equipment is sold through Iranian import firms. In 1976, there were eight companies importing tractors, 21 companies importing agricultural equipment and implements, 20 companies importing irrigation equipment and 10 companies importing poultry equipment. However, a large percentage of equipment imports are handled by just a few firms (see table 11). For instance, six importers account for more than 80% of the imports of farm implements such as cultivators, seeders, sprayers, and harvesting equipment. Importers of farm implements generally limit their business to farm equipment. However, most of the importers of poultry equipment, irrigation systems, and pumps carry a variety of agricultural and non-agricultural products. Some foreign suppliers, such as Alfa-Laval, have set up their own Iranian sales and service firms.

The market for farm services will be dependent on the willingness of service firms to take the time needed to develop entry into the market. Successful involvement in farm management by a foreign company would require that the company establish a strong presence in Iran to develop creditability with the farming community and to adapt its services to local farming requirements.

The basic marketing ethic of the agricultural equipment industry in Iran involves the notion that the customer must approach the importer rather than the importer reaching out to the customer. This marketing ethic is rooted in the Iranian culture and

**Table 11.—Iran: Major Agents of Agricultural Equipment (1976)**

Agent	Equipment
Ag Center Company .....	Forage harvesters, feedmill mixer/grinders, balers, hay rakes, rolling cultivators, reaper/binders.
Ag Farm Company .....	Combines, balers, farm wagons, grain drills, pull type corn picker/shellers, discs, vegetable planters, reaper/binders.
Iran-Anglo Company .....	Tractors, drills, planters, discs, balers, plows, hay equipment, swathers both self propelled and pull-type, hay stackers, rolling cultivators, fertilizer spreaders.
TCC Company .....	Tractors, combines, garden tractors.

Source: Trade interviews.

business mentality. It places a great emphasis on the relationship and personal trust developed over many years between the dealer and the customer. The purchase of new equipment, particularly by the large private farmers, is generally based on the word of the dealer that the equipment will be productive rather than a demonstration or discussion of the equipment's technical or economic performance.

In general, neither suppliers of agricultural equipment nor local agents have developed product strategies for the Iranian market. The foreign supplier sells through Iranian dealers and agencies who are given the exclusive franchise for product lines. The suppliers generally sell to the dealers on a letter of credit basis, rarely providing products for test marketing or demonstrations. They usually ship equipment only when there is a specific order and letters of credit have been signed. Clearly, any company which would identify market opportunities for specific products and formulate strategies to develop such potential could greatly benefit in terms of sales. Farm equipment companies should also develop marketing strategies that emphasize the purchase and successful use of their products by the large agribusinesses, which are viewed as demonstration projects by Iranian farmers.

Iranian dealers generally handle all marketing efforts. However, they are extremely conservative and often lack an aggressive market development outlook. Generally, an importer takes orders from farmers rather than pushing specific products. Sales efforts are usually handled by the firm owner and perhaps one or two salesmen. Only three firms employ sales managers. Marketing of farm machinery is primarily conducted in the Tehran offices of government projects, private agribusiness companies, and ministries connected with agricultural cooperatives and farm corporations. The importers are represented in farm areas by local agents located in most major provincial cities. These agents generally deal in a wide range of products of which agricultural



machinery is a minor part. The agents rarely leave their offices in the local bazaars and provide little service to customers.

Importers of farm equipment provide very little after-sales service to customers. They do not carry adequate inventories of spare parts and employ few trained mechanics and service personnel. Importers are required by the Ministry of Agriculture to stock a minimum of 15% of the value of imported equipment in spare parts, but they generally evade this requirement. The importers claim that the government's legal maximum markup of 15% on warehouse costs of equipment prevents them from providing adequate spare parts inventories and service personnel. The actual markups earned by the importers greatly exceed the 15% level, however.

Imports of most agricultural equipment are exempted from tariff duties, but are subject to commercial benefit taxes. These products include: Emitters for drip irrigation systems, polyethylene pipes, hammer mills, sprayers, pumps, and incubators for hatcheries. The importation of some items of agricultural equipment requires government permission. The government plans to reduce and eventually eliminate imports of turbine pumps and irrigation pipe. The objective of the import controls is the protection of domestic manufacturers.

Promotional efforts of importers are generally limited to distribution of commercial literature provided by the equipment suppliers. Most of the equipment pamphlets are in English. The importers also display a limited amount of equipment at the annual fall agricultural trade fair usually held in October at the International Trade Center in Tehran. The importers occasionally run advertisements in the weekly farm magazine *Deghan-e-Ruz* (Contemporary Farmer) (112 Sasan Ave., Eisenhower Ave., Tehran).

There is a great potential for the development of active marketing approaches. The strong market position of the products of Baresh Ab, Drip Irrigation Company, and Big Dutchman largely result from the activities of the sales and technical staffs of these firms which provide advice, design, installation and service for farmers.

Several of the importers have undertaken aggressive promotional efforts from time to time. During the last 3 years, Agrifarms has conducted field trials and demonstrations of Soviet-manufactured mechanized cotton pickers to determine the equipment's stability in Iran and to expose farmers to the concept of mechanical cotton harvesting. The management of Irano-Anglo spends a considerable amount of time in the field and has conducted several demonstrations of new equipment such as International Harvester Co. (U.S.) cotton pickers and Hesston Corp. (U.S.) forage harvesters. The Baresh Ab

Company is sponsoring experiments with a variety of sprinkler irrigation systems in Khuzistan.

## COMPETITIVE POSITION OF U.S. SUPPLIERS

In 1976 most major U.S. suppliers were represented in Iran. Some of these suppliers, such as Deere & Co. and FMC Corp., are engaged in assembly operations. In the mid-1970's there was a marked increase in domestically manufactured agricultural equipment. In 1975 approximately 50% of the demand for agricultural equipment was satisfied by local manufacturing operations. By 1980 it is expected that 65% of total agricultural equipment sales will be made by domestic suppliers.

U.S. companies should be aware of the Government of Iran's policy for becoming self sufficient in agriculture and its very high priority on farm mechanization. This has resulted in the establishment of several joint ventures and licensee arrangements in Iran by both U.S. and foreign suppliers. It is expected that by 1980 much equipment such as tanks, feeders, tractors, implements and other basic agricultural machinery and parts will be closed to importation to protect local manufacturers.

Additionally, there have been many barter arrangements between the Government of Iran and foreign countries, such as, Bulgaria, Romania, the Soviet Union, and North Korea and these agreements will play a role in the supply of agricultural equipment, especially to government organizations.

Such U.S. suppliers as Deere & Co., which accounted for 70% of the combine market; Caterpillar Tractor Co., which accounted for roughly half of land-development equipment; and Peerless-Iran Co. division of FMC which assembled roughly one-third of all irrigation pumps; were assembling in the country in 1976. U.S. suppliers with good market shares should look increasingly toward local assembling operations in order to avoid a loss of sales due to greater local manufacturing in the future. Small U.S. suppliers have not done well in Iran because of their lack of competent distributors, and because they have not made their presence felt in the marketplace. These U.S. suppliers must take more aggressive marketing efforts if they are to compete with European and Far East countries in supplying Iran's agricultural equipment needs.

U.S. equipment is often not selected in large tenders because of the lack of servicing operations in the country and because of high equipment costs, attributable to both transportation expenses and high local distributor costs. Customers in most cases are inundated by offers for equipment from European and Japanese suppliers, while U.S. firms appear to

be slow to react and also not willing to negotiate on the final price of equipment. Lead times between orders and delivery date are extremely long for U.S. equipment when compared with West German, Israeli, Eastern European, and Soviet equipment. Because of the need to supply equipment for particular time periods (harvesting or planting times), U.S. equipment must be in country at the time of need or the equipment simply cannot be used that year.

U.S. suppliers must strengthen their efforts to find more qualified local distributors willing to stock both machinery and spare parts. They also must give delivery schedules which are in line with the growing seasons if their market share is not to be

undermined even further by competition from other countries. In addition, those firms with good sales in the country should carefully consider whether local assembling is desirable in order to consolidate or keep their market share in the face of growing competition from other foreign firms.

If U.S. firms take a greater interest in the Iranian market and are willing to invest both in marketing efforts and local manufacturing, their market share could be raised an additional 5% from 1976 levels. However, it is unlikely that more significant gains can be made in view of the strong competitive situations existing in the Iranian agriculture machinery market in the 1970's.

### *List of Principal Approved Agricultural and Agribusiness Projects (1976)<sup>1</sup>*

Project Name	Location	Capital <sup>2</sup> (Millions of U.S. Dollars)	Products Annual
<i>Dairy and Meat Projects</i>			
Astraba, Animal Husbandry Complex .....		57.1	200,000 hectares 500,000 sheep 50,000 cows
Eslami, Animal Husbandry .....	Nowshahr	57.1	1,500 sheep 150 hectares land
Ir-Sur D and M Complex .....	Kermanshah	35.4	10,000 dairy cattle 50,000 sheep 50,000 tons milk 30,000 tons beef 1,000 tons lamb and mutton
Ran, Dairy and Meat Complex .....	Behshahr	27.1	24,000 tons of meat 10 tons of milk growing to 50 100,000 sheep
Mazandaran Dairy and Meat Complex .....	Sari	24.3	6,000 dairy cows 2,200 hectares land 30,000 tons dairy products 150 tons per day by factory
Animal Husbandry Poshtkoh .....	Lorestan	21.4	5,000 dairy cows 100,000 sheep
Diba Dairy and Meat Complex .....	Arak	20.0	5,000 dairy cows 80 tons milk increasable to 140 tons per day 2,800 hectares land
Animal Husbandry and Agricultural Co., Alvand .....	Hamadan	17.8	5,000 cows for milk Milk factory production: 100 tons daily 3,000 hectares land
Razavi Dairy and Meat Complex .....	Mashhad	17.8	4,500 hectares land 13,500 tons meat
Irano Britain Dairy and Meat Complex .....	Tehran Qazvin	16.0	40,000 tons milk 700 dairy 600 tons of butter 1,800 tons beef 20,000 cows
Gilan Dairy and Meat Complex .....	Rasht	14.3	14,000 cows 35,000 tons of milk 1,700 tons of meat 4,200 hectares land
Ir-Frami Dairy and Meat Complex .....	Esfahan Tehran	14.3	Sales of 7,000 cows 4,000 tons milk 500 cows
JAF Agricultural Institution .....	Zanjan	14.3	1,000 sheep 100 tons meat 1,000 hectares



*List of Principal Approved Agricultural and Agribusiness Projects (1976)<sup>1</sup>—Continued*

Project Name	Location	Capital <sup>2</sup> (Millions of U.S. Dollars)	Products Annual
Pars Dasht Agro-Industry .....	Gonbad Kavoos	14.3	10,000 dairy cattle 20,000 sheep 50,000 tons milk 1,350 hectares land
Semnan Agro-Industry .....	Tehran	14.3	1,300 tons meat 700 tons dairy 2,000 cows 2,000 hectares land
Voshmgri Agro-Industry .....	Gorgan	14.3	150,000 sheep for producing 10,000 tons of meat
Ziaran, Production and Packaging Meat .....	Qazvin	14.3	35,000 tons of beef
Shirnan, Dairy and Meat Complex .....	Khorrasan	13.3	50,000 cows 8,700 hectares under cultivation 33,000 tons of meat 3,600 tons of milk 8,000 sheep
6th Bahman Meat and Dairy Complex .....	Shahryar	12.8	2,000 dairy cattle 10,000 tons of milk 4,000 sheep 7,200 tons meat
Torbat Jam Husbandry Co. ....	Khorrasan	10.0	5,500 hectares 500 cows 10,000 sheep improving to 20,000
Khayami Meat and Milk Complex .....	Saveh	8.6	1,000 hectares 75,000 sheep 25,00 sheep for meat 400 calves
Reza Animal Husbandry Co. ....	Fariman Mashhad	8.6	100 dairy cows 150 hectares
Dousha .....	Saveh	7.3	5,000 cows 1,400 hectares
Almtag, Agro-Industry .....	Khuzistan	7.1	2,000 dairy cattle 4,000 tons catsup 2,000 hectares land
Milk and Meat Warn .....	Layostak	7.1	50,000 hectares 100,000 sheep
Mahyar Dairy and Meat Complex .....	Esfahan	6.9	600 cows 20,000 sheep
Bahadori Dairy and Meat Complex .....	Sarah	5.9	1,000 cows 5,000 tons milk 57 tons meat—6272 tons of forage 300 hectares land
Jenat Abbad Sheep Raising Project .....	Torbat Heidarieh	5.7	30,000 meat sheep increasing to 50,000
Lanark, Agro-Industry .....	Esfahan	5.7	500 hectares 1000 cows 10,000 sheep 20,000 pigs
Sang Dasht Agro-Industry .....	Zanjan	5.7	300 dairy cattle increasing to 1,000 1,500 hectares land
Sepahan, Dairy and Meat Complex .....	Tehran	5.7	600 tons of beef 15,000 tons of milk 2,500 milk cows
224 Poultry Co. ....	Esfahan	5.4	500 hectares 160,000 sheep 5,000 cows
Beyganey, Agro-Industry and Animal Husbandry Complex .....	Esfahan	4.3	500 dairy cattle 5,000 sheep
Kazerooni Animal Husbandry Complex .....	Esfahan	4.3	8,000 tons milk 5 tons meat 1,000 hectares land 1,500 dairy cattle

*List of Principal Approved Agricultural and Agribusiness Projects (1976)<sup>1</sup>—Continued*

Project Name	Location	Capital <sup>2</sup> (Millions of U.S. Dollars)	Products Annual
Masva Animal Husbandry .....	Tehran	4.3	1,200 dairy cattle 700 hectares land
Far Ziss .....	Fars	4.1	1,000 dairy cows 5,000 tons milk
Nikon Animal Husbandry Co. ....	Khorrasan Mashhad	4.0	1,000 cows 5,000 tons milk 200 tons meat 500 hectares
Piraghom Milk and Meat Complex .....	Ardebil	4.0	600 hectares 2,000 tons milk 1,200 tons meat Milk factory: 50 tons daily 250 cows for milk
Golestan Dairy and Meat Complex .....	Gorgan	3.5	1,000 dairy cattle 5,500 tons milk 52 tons meat
Dam va Daneh Dairy Complex .....	Boein Zahra	3.2	1,000 dairy cattle 5,000-10,000 tons milk 6,000 tons fruit 500 hectares land
Mafin Abbad Animal Husbandry .....	Saveh	3.0	1,000 dairy cattle 470 hectares land
Golshan, Wool and Meat Complex .....	Karaj	2.8	700 meat cattle 8,000 cows 124 tons meat
Magsal Agricultural and Poultry complex .....	Qazvin	2.8	1,000 hectares under cultivation 100,000 sheep 10,000 cows
Rahnama, Animal Husbandry .....	Shiraz	2.8	700-800 dairy cattle 5,000 meat sheep
Yoush an Ted, Dairy Complex .....	Qazvin	2.8	1,700 hectares under cultivation 400 tons meat 6,000 tons milk 1,200 milk cows 1,500 sheep
Taheri Milk and Meat Complex .....	Ardestan	2.6	2,500 feeder crops 500 cows 100 sheep
Mokhbar Farahmand Dairy and Meat Complex .....	Qazvin	2.5	500 dairy cows 2,000 tons milk 100 tons meat
Ganjavy Sheep Raising Complex .....	Central Prinvince	2.4	5,000 sheep 125 tons of meat
Iran Milk and Meat Complex Protein .....	Mazandaran Alamdeh	2.4	500 cows for milk 2,500 tons milk
Khorassan Animal Husbandry Complex .....	Mashhad	2.4	20,000 cows 1,200 rams 2,000 hectares
Rezaei Animal Husbandry .....	Gorgan	2.4	10,000 meat sheep 30 tons wool 150 tons meat 3,000 hectares land
Sepahan Agriculture and Animal Husbandry .....	Esfahan	2.4	1,200 dairy cattle 5,000 ewes 1,000 hectares land
Barmshore, Animal Husbandry .....	Shiraz	2.1	1,100 dairy cattle 1,000 hectares land
Bi-Jean Sheep Raising .....	Tehran	2.1	3,000 ewes 350 hectares land
Cattle and Dairy Producing Company .....	Shahdasht	2.1	1,000 dairy cattle 5,000 tons milk
Firouzabadi Sheep Raising .....	Tehran	2.1	2,000 meat sheep increasing to 5,000 600 hectares land



# *List of Principal Approved Agricultural and Agribusiness Projects (1976)<sup>1</sup>—Continued*

Project Name	Location	Capital <sup>2</sup> (Millions of U.S. Dollars)	Products Annual
Govaresak Dairy Project Complex .....	Mashhad	2.1	100 dairy cows 450 tons milk 15 tons meat
Irdan Dairy and Meat Complex .....	NA	2.1	500 dairy cattle 2,500 tons milk Sales of 10,000 cows
Kholazir, Dairy and Meat Complex .....	Tehran	2.1	270 dairy cattle 39 tons meat
Tavakol, Animal Husbandry .....	Shahryar	2.1	1,100 dairy cattle 10,000 sheep 700 hectares land
Toorshil Dairy and Meat Complex .....	Lorestan	2.1	1,500 tons milk 40 tons meat 350 dairy cattle
Ghara-Ghol, Meat and Hide Complex .....	Qazvin	2.0	10,000 sheep 250 tons meat 5,000 hides
Mossavi Dairy .....	Maragheh	2.0	500 cows 3,000 tons milk 300 hectares
Rahmatabad, Dairy and Meat Complex .....	Fars	2.0	1,500 tons milk 100 tons meat 300 dairy cattle
<i>Poultry and Eggs</i>			
Agri-Industry Complex Meshkanad .....	Qazvin	20.9	5,000 tons chicken meat 6,000 tons of eggs 1,500 hectares for fodder crops
Bahareh Producing Co. ....	Esfahan	10.1	180,000 hens 75 million eggs 9 million hatchery
Hen's Meat, Producing Group .....	Tehran	9.3	100 million hens
Morghak Poultry Complex .....	Sari	7.9	3,750 tons eggs 81 tons meat
Golshiry Poultry Improving Plant .....	Esfahan	2.7	1,350,000 day-old chicks 900 tons meat 252 tons eggs
Egg Production Plant .....	Yazd	1.9	252 tons eggs
Mahbobi Poultry .....	Shahi	1.4	150 tons meat 100,000 hens 25 million eggs
<i>Other</i>			
Karoon Cane Sugar Complex .....	Khuzistan	357.1	200,000 tons sugar
Silk Worm Project .....	Gilan	57.1	2,600 hectares walnut trees 2,000 tons milk
Eghbal Poultry Co. ....	Qazvin	6.0	4,400 tons meat 7 million eggs 300 hectares land
Sheep Raising Goonbad .....	Goinbad	5.8	50,000 ewes 10,000 hectares
No-Daneh Agro-Industry .....	Arak	4.7	5,000 tons slate 750 tons wheat 20,000 fresh feed 30,000 dried feed 1,200 hectares land
Improved Seed Producing Complex .....	Mazandaran	4.1	629 tons corrected seeds 8 tons canned fruit 1,000 hectares land
Fish and Duck Meat Producing Complex .....	Gilan	3.1	200 hectares 900 tons of fish meat 350 tons duck meat
Afshar Sheep Raising .....	Zanjan	3.0	100,000 ewes
Agri-Industry Amiriyeh .....	Goonbad	2.9	4,000 tons apples and pears
Gorgan Agro-Industry .....	Gorgan	2.5	800 tons of catsup 5,000 tons apples 5,000 tons potatoes

*List of Principal Approved Agricultural and Agribusiness Projects (1976)<sup>1</sup>—Continued*

Project Name	Location	Capital <sup>2</sup> (Millions of U.S. Dollars)	Products Annual
Agri-Industry Noghan .....	Rasht	2.4	200 hectares orchards mulberry
Jiroft Agro-Industry .....	Jiroft	2.4	200 hectares land 3,000 tons oranges and grapefruit 7,000 tons packaged vegetables
Takestan, Marnadasht Co. ....	Fars	1.7	900 hectares 27,000 tons of raisins
Kaldin Agro-Industry .....	Karaj	1.4	190 hectares land 4,000 apples 1,000 to 4,000 tons cold storage capacity
Fish Farm Company .....	Gilan	0.7	240 tons fish
Makerp Fish Complex .....	Mazandaran	0.7	220 tons fish
Iran Ahzar Fish Meat Production .....	Mazandaran	0.4	88 tons of fish
Kareh Jar-Almond Complex .....	Mahallat	0.3	100 hectares land for growing almonds
Safa Agro-Industry .....	Amol	0.2	150 tons apples and pears 50 hectares orchards

Source: Ministry of Agriculture, Agricultural Development Bank of Iran.

<sup>1</sup> This appendix is provided to give an indication of the types and sizes of projects that have been considered by the Government and private investors. These projects were approved on the basis of feasibility studies submitted to the Ministry of Agriculture and ADBI. In some cases, loans have been granted, in others the projects may have been abandoned or are in an indefinite status. The Ministry of Agriculture and ADBI will release further information on specific projects only in response to what they consider as bonafide inquiries.

<sup>2</sup> Listed capital reflects actual amounts approved by the Ministry of Agriculture or ADBI. Many of these projects require the purchase of land and major capital expenditures for land improvement and infrastructure development. Other projects are expansion projects that do not require such high levels of additional capital.



# Chemical Industries

IRAN'S CHEMICAL industries have been expanding rapidly since the early 1970's. Government planners expect petrochemicals to become one of Iran's leading industries by the early 1980's. They also predict Iran will supply over 5% of world petrochemical production by 1985.

Equipment purchases for the Iranian chemical industries grew from \$28 million in 1973 to over \$78 million in 1975. By 1980, primarily as a result of large government petrochemical projects, annual demand for equipment is expected to grow to \$177 million.

U.S. suppliers held 20% of the market for chemical process equipment and instrumentation during 1975, and American firms played a major role in the implementation of petrochemical technology and plant design. Because of their involvement in new plant construction and their reputation for advanced chemical and petrochemical processing equipment and technology, U. S. suppliers are expected to continue to account for a significant portion of the market through 1980. However, they will have to contend with stiff competition from Japanese and European suppliers.

## STRUCTURE AND SIZE

### The Petrochemical Industry

Government planners view the petrochemical industry as the best use of the country's oil and gas resources. Over \$80 billion in new capital investment is expected to be committed to the industry during 1975-85.

Capital expenditures in the petrochemical industry totaled approximately \$441 million in 1975, and the industry employed 4,127 people in five government-owned plants (see table 1). That year the value of Iran's petrochemical industry output was \$141.3 million.

The National Petrochemical Company (NPC) is principally responsible for development of the industry. Formed as a separate subsidiary of the National Iranian Oil Company (NIOC) in 1965, this government-owned organization operates wholly owned

**Table 1.—Iran: Development Indicators of the Chemical Industries**

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
Product Sales in millions of						
U.S. dollars						
Petrochemicals .....	16.5	85.3	104.5	141.3	268.6	527.9
Cosmetics/Soap .....	36.5	60.6	77.2	82.9	100.6	250.1
Pharmaceuticals .....	24.5	46.2	53.6	70.7	78.9	124.0
Paints .....	17.5	22.3	25.3	28.0	31.7	49.9
Total sales .....	99.6	211.3	260.6	322.9	479.8	951.9
Exports in millions of						
U.S. dollars						
Petrochemicals .....	5.2	16.0	22.0	24.41	29.0	60.1
Cosmetics/Soap .....	8.3	5.8	12.1	17.44	19.0	27.8
Pharmaceuticals .....	-0-	.2	.2	.50	.7	1.7
Paints .....					.1	.2
Total exports .....	13.5	22.0	34.3	41.8	48.8	89.8
Employment						
Petrochemicals .....	3,018	3,676	3,843	4,127	4,539	9,412
Pharmaceuticals .....	1,957	2,572	2,768	2,862	3,291	4,818
Cosmetics/Soap .....	2,014	2,367	3,154	3,185	3,503	5,129
Paints .....	757	1,020	1,118	1,277	1,340	1,629
Total employment .....	7,746	9,635	10,883	11,451	12,673	20,988
Capital Expenditures in millions of U.S. dollars						
Petrochemicals .....	89.7	146.3	236.1	441.0	535.0	917.6
Other chemicals .....	12.0	20.4	28.3	79.0	63.0	149.4
Total expenditures .....	101.7	166.7	264.4	520.0	598.0	1,067.0

<sup>1</sup> Estimated.

Source: Bank Markazi, NPC, Trade Interviews and Trade Estimates.

companies and engages in joint ventures with private investors.

**NPC Companies.**—In 1975, five large public sector companies operated a petrochemical plant, the Iran Fertilizer Company, Abadan Petrochemical Co., Shahpur Chemical Company, Kharg Chemical Company and the Iran Carbon Company Limited. All five companies are located in the southern part of the country, close to supplies of oil and natural gas feedstocks. Chemical products produced from these five companies rose from 160,000 tons in 1970 to over 1,700,000 tons in 1975 (see table 2). Much of the output of Iran's petrochemical plants has been fertilizer. Fertilizer consumption in Iran rose from 200,000 tons in 1970 to over 450,000 tons in 1974 of which about 220,000 tons were domestically produced.

The Iran Fertilizer Company was the first of Iran's chemical companies. Formed in 1961 with a fixed capital of \$26.6 million, the company is a fully owned subsidiary of the NPC. Its plant in Marvdashte near Shiraz was modernized at a cost of \$20.6

**Table 2.—Iran: NPC's Production of Major Chemicals**  
(Tons)

Chemical Compound	1970	1973	1974	1975	1980 <sup>1</sup>
D.D.B. ....	6,400	7,030	10,200	12,000	15,000
P.V.C. ....	11,300	20,300	19,500	20,000	60,000
D.A.P. ....	0	191,400	19,800	200,000	219,000
Urea ....	56,000	201,000	200,000	217,000	1,242,000
Ammonia ....	NA	246,600	270,000	300,000	395,000
Sulphuric Acid ....	22,400	27,100	29,000	32,000	680,000
Sulphur ....	50,000	363,500	390,000	445,000	2,930,000
Other ....	13,900	160,000	385,000	529,000	800,000
Total ....	160,000	1,216,930	1,323,500	1,700,000	6,341,000

<sup>1</sup> Estimated.

Source: NPC and Trade Sources.

million in 1973. In 1975 the Iran Fertilizer Company, using the total output of its 44,500 tons annual capacity ammonia unit, produced 52,000 tons of urea and 32,000 tons of ammonium nitrate. Its remaining production consisted of 4,000 tons of nitric acid, 63,000 tons of soda ash, 50,000 tons of NPK mixer fertilizer and 30,000 tons of tripolyphosphate (STPP). The NPK fertilizer and STPP production units became operational in early 1975.

The Abadan Petrochemical Company, Ltd. is a \$40 million joint venture formed in 1967 between The B.F. Goodrich Company (U.S.) which has 26% ownership and NPC, which has the remaining 74%. This plant produces raw materials used in the nation's plastics and detergents industries. In 1975, Abadan Petrochemical produced over 22,000 metric tons of PVC, 12,000 metric tons of DDB, and 24,000 metric tons of liquid caustic soda. In 1973, a \$6 million expansion project was begun by the company to increase output of PVC. The Lummus Company Ltd. (U.K.), a subsidiary of Engineering Inc. (U.S.), was the designer and contractor for this project. The company's production of PVC rose to over 40,000 tons in 1976, and is slated to reach 60,000 tons at full capacity.

The Shahpur Chemical Company Ltd., located near Bandar Shahpur on the Persian Gulf, and capitalized at \$175 million, was one of the largest petrochemical complexes in the world in 1976. Shahpur Chemical was originally a joint venture; 50% of the shares was held by Allied Chemical Corp. (U.S.) and the remaining 50% by the NPC. In 1973 Allied Chemical sold its equity to the NPC. The company's raw feedstocks include imported phosphate rock and sour natural gas with 60% methane content, 25% hydrogen sulfide, and 12% carbon dioxide. In 1975 Shahpur Chemical produced 170,000 tons of ammonia, 215,000 tons of sulphur, 150,000 tons of urea, 10,000 tons of sulphuric acid, 42,000 tons of phosphoric acid and 170,000 tons of diammonium phosphate (DAP). A major expansion program was underway in the mid-1970's.

The Shahpur plant includes both pneumatic controls in the older units and electrical controls in the

newer processing lines. Each separate production unit is associated with an individual analog loop, with instruments in the control room. The largest unit has 300 closed loops. Expansion plans include the addition of approximately 1,000 closed loops. Digital instrumentation and supervisory computers will also be installed. The principal suppliers of instrumentation and controls to the Shahpur plant are The Foxboro Co. (U.S.), Honeywell Inc. (U.S.), and Yamatake-Honeywell Co. Ltd. (Japan). Fisher Controls Co. (U.S.) valves and some Bailey Instruments Co. Inc. (U.S.) instruments are used on boilers and steam mains.

The Kharg Chemical Company, Ltd. was established in 1967 as a 50-50 joint venture between NPC and Amoco International S.A. (Switzerland), a subsidiary of the Standard Oil Company (Indiana) (U.S.). The initial investment totaled \$12 million. In 1975, over 230,000 tons of sulphur and 30,000 tons of propane and butane gas were recovered from associated gases obtained from the Darius and Kharg fields. A further byproduct, natural gasoline, is blended in Darius crude. Plans to approximately double the capacity of Kharg Chemical were suspended in 1976 pending decisions on requirements of associated gas for reinjection.

The Iran Carbon Company, Ltd. is a joint venture between Cabot Corporation (U.S.), the Industrial Mining and Development Bank of Iran (IMD-BI), NPC, and the World Bank Group's International Finance Corporation. In 1974 it began producing a total of 16,000 tons of furnace carbon black, the main filling material used in Iran's rubber industry. The firm had plans to double its capacity.

## Oil Refineries

Iran's state petroleum company, the National Iranian Oil Company (NIOC), owned and operated four oil refineries and two topping plants in 1976. The oil refineries had a total throughput capacity of 825,000 barrels per day (bbl/d) in 1975, and processed a total of 249.7 million bbl. The following indicates refinery capacity and actual throughput during 1970-76:

(Millions of bbl/yr)					
	1970	1973	1974	1975	1976 (estimate)
Throughput capacity .....	219.0	240.9	277.4	301.0	350.0
Actual throughput ....	200.8	214.6	230.3	249.7	285.0

Output of refinery products during calendar year 1976 was estimated as follows:



	(millions of bbl)
Gasoline .....	32.9
Kerosene .....	32.9
Gas Oil .....	47.0
Residual fuel oil .....	96.7
Aviation fuel .....	12.5
Total .....	222.0*

\* Based on exports and domestic consumption; does not specify motor oil, bitumen, LPG and some other minor products.

The Abadan refinery is the country's largest, accounting for over two-thirds of all refined oil output, and is the chief export refinery. Throughput capacity in 1975 was 470,000 bbl/d. Exports, begun in 1913, are now handled through a four-product pipeline running to a modern automated terminal at Bandar Ma'shur on the Persian Gulf. This terminal loads 100 different products. Expansion work underway in 1976 will raise the capacity of Abadan refinery to 600,000 bbl/d.

The Tehran refinery, completed in 1968, has a capacity of 85,000 bbl/d. It was the first of the in-

land refineries built specifically to meet the rising demand of domestic consumption. Expansion and "debottlenecking" projects have raised capacity to 125,000 bbl/d. A second installation, located at the same site and completed in 1974, has added an additional 100,000 bbl/d capacity. The refinery is fed by two pipelines from Ahvaz capable of delivering 550,000 bbl/d of crude oil.

Both of the Tehran refinery units were built by Fluor Engineers and Constructors, Inc., subsidiary of Fluor Corporation (U.S.), in a joint venture with Thyssen-Rheinstahl Technik GmbH (West Germany) and Iranian partners. The newer unit is a near duplicate of the older plant and includes a two-stage crude distillation, unifier-platformer, Isomax hydrocrackers, and visbreaker. A lube cut distillation unit and hydrogen, LPG, nitrogen, asphalt, and sulfur plants are also part of the complex. A 21,600 kilowatt (kW) power plant makes the refinery self-sufficient. The two units are completely integrated so that functions can be shifted to complementary



*Distillation columns in the newest crude unit at the Tehran refinery which increased its capacity 100,000 barrels per day.*



process units to facilitate continued operation during maintenance. The refinery produces a full range of products from lubrication oils and asphalt to all types of fuel, including LPG, gasoline, kerosene, diesel fuel, heating oil, and fuel oil. Fluor set up an extensive training program to develop the necessary labor force of welders, pipefitters, electricians, heavy equipment operators and other skilled technicians required to implement the project. Design and engineering personnel were also trained.

Instrumentation and controls in the two Tehran refinery units are among the most advanced in Iran. The two plants incorporate at least 480 closed control and instrumentation loops. Digital measurement is used on the flowmeter provers, and a few digital control loops are incorporated in the aviation fuel continuous blender. Between 30 and 35 on-line analyzers are installed in the plants. These instruments include an Arcco Instrument Co. Inc. (U.S.) specific gravity analyzer, a Foxboro (U.S.) pH analyzer, and a Milton Roy Co. (U.S.) dissolved oxygen analyzer. The older refinery unit has three control rooms with individual pneumatic controllers. Each has a thermocouple-actuated multipoint temperature indicator. A supervisory computer has also been installed.

The Kermanshah refinery was built in 1935 and is supplied by crude oil from the Naft Shah oil fields located near the Iraqi border. Capacity has been raised from 10,000 to 15,000 bbl/d.

The Shiraz refinery went into operation in 1973 and has a design capacity of 40,000 bbl/d.

The Masjed-e-Soleiman topping plant has a capacity of 75,000 bbl/d. The Lavan topping plant at the Lavan Island Crude Oil Export Terminal went into production in early 1976 with 20,000 bbl/d capacity. Production from this plant is used almost exclusively for fueling tankers calling at the port.

There are four major sources of lubricating oils in Iran. NIOC's Abadan refinery produces about 50,000 barrels per month, all of which are consumed domestically. In late 1974, the Lummus Company, a subsidiary of Combustion Engineering Corp. (U.S.), completed construction of NIOC's new 100,000-ton annual capacity lubricating oils refinery, which is located adjacent to the Tehran oil refineries. The third lubricating oils refinery is the Towlid-Rowghan plant which is owned 34% by Exxon Corp. (U.S.) and 66% by Sabet-Pasal, a private Iranian group. Its annual capacity is about 30,000 tons, but it has received government approval for a "debottlenecking" project to raise capacity to 50,000 tons per year (tons/yr) of lubes. Pars Oil Refinery is another private refinery, the majority of which is owned by Iranian private investors and a minority by Royal Dutch Shell (Netherlands). Its capacity is also about 30,000 tons annually.

## Other Chemical Products

**Paint Manufacturing.**—In 1975, there were nine major paint manufacturing firms producing over 35,000 tons of paint products annually with an estimated \$28 million in total sales. These firms and their annual output capacity in tons are:

Dyrup Company .....	6,000
Ranguin Company .....	5,500
Pars Chemical Company .....	5,100
Taba Chimi Company .....	4,000
Hawilux Company .....	3,650
Super Rang Company .....	3,500
Plaskar Company .....	3,000
Shams Company .....	3,000
Irang Company .....	2,500

The Pars Chemical Company is a leading Iranian producer of both resins and paints which produced 190,000 liters of paint per month in 1975. The firm had a 5-year technical agreement with Pacific Products, Inc. (Philippines) which expired in early 1976. The firm's output in 1975 was 33% architectural paints, 33% automotive and industrial paints, with the remainder being marine paints sold to Iranian shipbuilders and the navy. The plant purchased its pigment grinders and mixing equipment in 1969 from Draiswerke GmbH. (West Germany).

Dyrup Iran, the largest firm, is a joint venture of the Danish firm S. Dyrup & Co. Ltd, and the Iranian Kampsax Co., which together own 45% of the equity in the company. In addition to producing 6,000 tons of paints in 1975, the firm also produced 300 tons of antifreeze that year. It employs 237 employees.

**Soap and Detergent Manufacturing.**—During the 1940s, the first powdered soap was introduced in Iran. It was a brownish substance with an herbal base called "chubak" (soap wort), and was usually sold by peddlers. Modern powdered soap was first introduced in Iran during the 1950's. In 1953 the Colgate Palmolive Co. (U.S.) set up a small plant in Tehran and produced powdered soap under the trade names of "Fab" and "Blue-Emo." In 1959 an Iranian firm, Kaf Co., began producing "Tide" under license from The Proctor & Gamble Co.

By 1976 there were six soap and detergent manufacturers in Iran (see table 3). Together they manufactured over 100,000 tons of soaps and detergents with total sales of \$40 million in 1975. Three-fourths of their total production that year was powdered detergents; the remainder was bar soap. Domestic consumption accounted for two-thirds of the total production in 1975 with the remainder exported to the Soviet Union and neighboring Persian Gulf States. The total capacity of the three leading firms in the industry is over 250,000 tons per year.

The largest producer of soap and detergent is Pars International Manufacturing Co., a joint ven-



**Table 3.—Iran: Soap and Detergent Manufacturers**

Name of the Company	Production	Annual Amount in Tons
Beshahr Industrial Company . . . .	Detergents	25,000
Tolidperse Company . . . . .	Powder Detergents and Bar Soap	24,000
Pars International Manufacturing Company . . . . .	Bar Soap and Powder Detergents	25,000
Mo'atar Company . . . . .	Powdered and Liquid Detergents	16,000
Pakshoo Chemical Company . . . .	Detergents	9,000
Pak-kon Factory Company . . . . .	Detergents and Liquid Soap	4,000

Source: Trade Interviews.

ture of The Pars Industrial Group with Proctor & Gamble, which was initiated in 1963 when the latter dropped its licensing arrangement with Kaf. In 1975 this firm manufactured 25,000 tons of laundry detergent and bar soaps. In 1975 "Tide" was Iran's leading brand of powdered laundry detergent.

The Tolidperse Company, a subsidiary of the KBC Industrial Group, is constructing a large plant in the new industrial city of Alborz, northwest of Tehran. The Tolid Daru plant, another detergent producing subsidiary of KBC, will be closed down and its manufacturing operations transferred to the new facilities when they are completed in 1977. Tolidperse makes powdered detergents, liquid dishwashing detergents and bar soap. These products are marketed through another subsidiary company, Alborz Distributing Co., which has a 600-man sales force and sells detergents and other products produced by the KBC Industrial Group to outlets all over Iran. In 1974 the company exported 10,000 tons of detergents to the Soviet Union as a result of a government barter arrangement.

**Pharmaceuticals.**—The pharmaceutical industry in Iran began to develop after World War II, but intensive capital investment in local manufacturing actually began in 1960. In 1975, 49 pharmaceutical producers existed in the country, of which 16 were members of the Pharmaceutical Syndicate and supplied nearly one-half of Iran's domestic output (see table 4).

Total production of pharmaceuticals, which was valued at \$90 million in 1975, has been growing at 15% per year. There is little formulation in Iran and most operations involve tableting, encapsulating and packaging of bulk drugs. Most of the large international pharmaceutical companies are already operating in the country. Such firms as Bayer AG. (West Germany), Pfizer Inc. (U.S.) and Parke Davis & Co., a subsidiary of Warner-Lambert Co. (U.S.), have an equity in Iranian manufacturing plants. Most of the other internationally known

**Table 4.—Iran: Pharmaceutical Companies, 1975**

Company	Location (all Tehran)	Annual Production in million dollars
Bayer Farma Co. (Bayer AG., Germany) . . . . .	Tehran Pars	5.8
Ber Limited Iran Co. . . . .	Tehran Pars 30 Km. Karaj	2.7
Daroupakhsh . . . . .	Express Road	15.2
Daru Manufacturing Co. . . . .	Old Karaj Rd.	7.1
Depar Laboratories . . . . .	Chitgar	2.2
Don Baxter Laboratories Iran (Baxter Laboratories Inc.) . . . .	Aramghah Road	6.3
Houkhst Co. . . . .	Tehran Pars	6.0
Iran Canoun Co. . . . .	16 Km. Karaj Rd.	3.7
Iran Merck Co. (Merck and Co. Inc.) . . . . .	14 Km. Karaj Rd.	3.2
LaPetite Iran Co. . . . .	Gholhak	6.2
Park Davis Co. (Park Davis, U.S.) . . . . .	12 Km. Karaj Rd.	2.9
Pfizer Co. (Pfizer Inc.) . . . . .	16 Km. Karaj Rd.	5.9
Pars Industrial Co. . . . .	14 Km. Karaj Rd.	5.2
Squibb Iran Co. (Squibb Corp.) .	12 Km. Karaj Rd.	3.9
Sayanamidki B.C. . . . .	Old Karaj Rd.	5.7
Tehranchimie . . . . .	14 Km. Karaj Rd.	3.7

Source: Trade interviews.

pharmaceutical firms have license agreements with Iranian manufacturing companies.

The E. R. Squibb and Sons Corp. (U.S.) began marketing in Iran in 1961 using an exclusive distributor. By 1966, the company decided that the Iranian market justified setting up a manufacturing plant in the country. E. R. Squibb & Sons of Iran S.A. (Squibb Iran) was initially formed in 1969 by Squibb Corp. and its distributor, Firooz Co. In the early 1970's Squibb bought out Firooz's share and became the sole owner of Squibb Iran. In 1976 the company was producing 56 different products with annual sales of nearly \$4 million. It employs 350 people of whom 50 are working in the sales department. Most of the machinery in the plant was obtained from Halligan and Kharg AG (West Germany) and Johann Wise Co. (U.S.).

**Plastics Manufacturing.**—In 1975 there were 22 plastics manufacturing companies operating in Iran of which only 3 had capacity of more than 10,000 tons of plastic products per year (see table 5). In 1975 total sales of domestic plastics manufacturers reached almost \$60 million. The major plastics producer in the country is Plascokar Corp. which in 1976 employed 500 people and produced 2,000 different products, including housewares, industrial and construction items. Raw material for plastics comes mainly from The Dow Chemical Co. (U.S.) and Mitsui Chemical Industry Co. (Japan). Plascokar produced over 10,000 tons of plastics products in 1975. Most of the machinery, including extruders and injection molders, was purchased from Hull Standard (U.S.), Negri Bossie Cia, S.p.A. (Italy) and Krauss-Maffei AG. (West Germany).

**Table 5.—Iran: Plastics and Plastics Products Manufacturers, 1976**

Company Name	Location	Capacity in tons	Products Produced
Plastihouse Co. ....	Qazvin	3,000	Bath tubs, P.V.C. pipe with connections
Poly Vina Co. ....	Qazvin	4,300	Bath tubs, P.V.C. pipe with connections
Private Esfahan P.V.C. Co. ....	Esfahan	2,600	Bath tubs, P.V.C. pipe with connections
Shiraz Artificial Plastic Co. ....	Shiraz	1,700	Bath tubs, P.V.C. pipe with connections
Onika Co. ....	Mashhad	900	Bath tubs, P.V.C. pipe with connections
Karadj Poly-Ka ....	Karadj	1,350	Bath tubs, P.V.C. pipe with connections
Plascolor Manufacturing Co. ....	Tehran	10,000	Furniture, industrial pieces, Poly-Acrlan film
Plasiran Co. ....	Tehran	13,000	Furniture, industrial tools
Fars-Plast Co. ....	Tehran	8,000	Sponge, melamine film
Pars-Plastic Co. ....	Tehran	5,000	Furniture, melamine
Bori-Plast Co. ....	Tehran	4,000	Shoes
Derakhshan Co. ....	Tehran	7,000	Shoes and soft sheet P.V.C.
Zartoshty and Partners ....	Tehran	8,000	Shoes and soft sheet P.V.C.
Shahvand Factory ....	Tehran	4,000	Shoes
Doudman Co. ....	Alborz	4,000	Shoes
Poly-Flex-Iran ....	Qazvin	1,500	Tubing
Laizer Co. ....	Qazvin	3,000	Sponge
Plastic Producing Co. ....	Tehran	1,500	Furniture, housewares, industrial pieces
Teheran Plastic Co. ....	Tehran	1,000	Furniture, tools, other pieces
Dony-Pela Co. ....	Tehran	3,500	Furniture, tools, other pieces
Plastic Materials Factory ....	Tehran	4,300	Preparation of material for P.V.C. powder
Plascokar Corp. ....	Tehran	12,000	Housewares, industrial and construction products

Source: Trade interviews.

**Table 6.—Iran: Miscellaneous Chemical Products Manufacturers**

Name of the Company	Location	Type of Production	1975 Output in Tons
Aminian Company ..	Esfahan	Calcium Carbonate	10,000
Alba Shemi Company.	Tehran	Sodium Sulphate	30,000
Chemical Industries Company .....	Tehran	Sodium Sulphate	1,000
Dural Company .....	Tehran	Sulphuric Acid	N.A.
Iran Ink Producing Company .....	Tehran	Sulphuric Acid	N.A.
Iran Lurio Company ..	Tehran	Printing Ink	600
Minak Company .....	Tehran	Printing Ink	700
Plant Engineering Company .....	Andimeshk	Fero Cilis	30,000
Toli-chemi Company ..	Tehran	Sodium Sulphate	1,500
	Tehran	Sodium Sulphate	30,000

Source: Trade interviews.

Another large Iranian plastics producer is Plasiran Co. which was formed in 1968 and has 350 employees. It produces 800 different types of products for household and industrial use. Because of the shortages of raw materials, the firm, which has a total capacity of 13,000 tons per year, only produced one-half that amount in 1976.

**Miscellaneous Chemical Products.**—A number of companies in Iran produce small amounts of sulphuric acid, sodium sulphate, printing inks and other industrial chemicals. Table 6 identifies some of these firms and their products.

## Government Role in the Industry

The state-owned National Petrochemical Company (NPC) is not only responsible for the imple-

mentation of all government petrochemical projects, but also regulates private investment in the industry. All petrochemical projects in the private sector must receive approval by NPC and also secure an operating permit from the Ministry of Industry and Mines. Likewise all basic refining of crude oil is done by the National Iranian Oil Company (NIOC) which wholly owns all oil refineries in the country.

Projects for the manufacture of chemicals, paints, varnishes, and other chemical products must be approved by the Ministry of Industry and Mines. Approval has been almost automatic for such projects as long as the project meets the Ministry's criteria for plant location.

For the manufacture of various pharmaceuticals and chemicals used in the production of foods, additional permits from the Ministry of Health are required. The Ministry of Health has instituted strict standards for the manufacture of such products. In addition, the Institute of Standards and Industrial Research of Iran has compiled industrial standards which must be maintained by the manufacturers of chemical products.

## TRENDS, PROGRAMS AND PROJECTS

Although still in its infancy, Iran's chemical and petrochemical industry is growing rapidly. Before 1961 no use was made of oil or gas for chemical or petrochemical production, but throughout the 1960's and 1970's, Iran increasingly employed its petroleum and gas resources for petrochemical feedstocks. From 1970 to 1975, total output of the petrochemi-



cal industry grew from \$16.5 million to \$141.3 million, a 55% average annual increase. The rise in world oil prices in 1973 resulted in the initiation of a number of petrochemical projects with potentially high returns on investment. Since then, the pace of petrochemical industry expansion has quickened considerably.

An objective of the Fifth Development Plan (1973/74–1977/78) that had already been achieved by 1976 was the expansion of PVC output at the Abadan Petrochemical plant. Other Fifth Plan projects, such as the expansion of Shahpur Chemical, the construction of a polystyrene plant and expanded production of STPP and various fertilizer compounds, were being implemented. The construction of the Iran-Japan Petrochemical Company complex will complete the list of Fifth Plan objectives for new production of olefins and aromatics and various chemicals monomers by the beginning of 1980.

Other chemical industries in Iran began to expand in the late 1960's. Consumer demand for chemical-based products rose sharply as per capita income increased from \$260 in 1965 to \$2,280 in 1975. Demand for chemicals for the construction industry, particularly plastics and paints, has risen rapidly in pace with investment in construction, which rose from \$1.5 billion in 1970 to over \$9 billion in 1975. Paint production, for example, which was only 16,000 tons in 1970, reached over 35,000 tons in 1975. The Government has also aided the development of the pharmaceutical industry, and sales climbed from \$24.5 million in 1970 to \$70.7 million in 1975.

## Projects

Government planners have allocated enormous financial resources to the development of the petrochemical industry, and in the early 1970's numerous projects were announced. It is expected that the number of government-owned petrochemical manufacturing companies will increase from 5 to 13 by 1980. Projects to expand capacity in existing plants will greatly increase output, while a number of new projects are also slated for implementation.

**Shahpur Chemical Company.**—NPC's Shahpur Chemical Co. was undergoing a major expansion project in 1976. The project included modification of the existing DAP, phosphoric acid and urea units, construction of new sulphuric acid and MAP units and of new water desalination and other auxiliary units. New ammonia and urea units were planned to begin production in January 1977, and new gas processing and sulphur recovery units were scheduled for completion in March 1977.

The following table compares the planned increase in Shahpur Chemical Company's production capacity with capacity in 1975 in thousands of tons.

Products	1975	1977
Ammonia .....	330	660
Urea .....	165	695
DAP .....	198	273
MAP .....	0	200
Sulphuric Acid .....	436	1,063
Phosphoric Acid .....	149	263

The overall expansion is being carried out by Stone and Webster Inc. (U.S.) Kellogg Construction Ltd. (U.K.) and Kellogg Continental B. V. (Holland), both subsidiaries of Pullman Inc. (U.S.), are contractors for the new ammonia and urea units respectively. The contractor for the gas treatment and sulphur recovery facilities is the Ralph M. Parsons Co. Ltd. (U.K.), a subsidiary of The Ralph M. Parsons Co. (U.S.). Both U. K. and U.S. subsidiaries of Davy Powergas Co. (U.S.) are contracting the MAP and DAP expansion projects.

**Iran Fertilizer Company.**—In a \$200 million project for expansion of this chemical complex to be completed by 1978, ammonia production is to be increased from 30,000 to 146,000 tons/yr, nitric acid from 4,000 to 110,000 tons/yr, and urea production from 52,000 to 547,000 tons/yr. The managing contractor for the project is Davy Powergas Ltd. (U.K.). Humphries and Glasgow (U.K.) is designing and constructing a new 1,200-ton daily capacity ammonia plant, and Heurty S.A. (France) has a similar contract for a 15,000 tons per day (tons/d) urea unit.

**Iran-Japan Petrochemical Company (IJPC).**—IJPC is a 50–50 joint venture (formed April 29, 1973) between NPC and the Iran Chemical Development Company. The latter is owned by Mitsui Shipbuilding & Engineering Co. Ltd. (45%), Toyo Soda Corp. (30%), Mitsui Toatsu Co. (15%), Mitsui Chemical Industry Co., (5%), and Japan Synthetic Rubber (5%). The plant will be located at Bandar Shahpur and will including the following core units (see figure 1):

- a salt electrolysis plant, to produce 250,000 tons/yr of caustic soda and 220,000 tons/yr of chlorine gas.
- a cracking unit for production of olefins, fed by 110,000 bbl/d of NGL's from the Khuzistan fields.
- a naphtha reforming unit, which will utilize some 24,000 bbl/d of naphtha from Abadan refinery to produce benzene and xylenes.

This complex, originally scheduled to begin production in 1978, was somewhat delayed by difficulties between the Japanese and Iranian parties in settling financial details. These difficulties were subsequently resolved, and loan agreements between Japanese and Iranian government agencies totaling \$718 million will be used to finance the IJPC proj-

ect. Some of the funds will be channeled into the Shahpur and the Iran Fertilizer expansion. The project is now scheduled to be operating by 1980 or shortly thereafter. Its annual production will be:

Products	Capacity (tons/yr)
Caustic Soda (liquid) .....	195,000
Caustic Soda (solid) .....	55,000
E.D.C. ....	170,000
V.C.M. ....	150,000
L.P.G. ....	1,500,000
Styrene Monomer .....	93,000
Low Density Polyethylene .....	100,000
High Density Polyethylene .....	60,000
Polypropylene .....	50,000
Propylene .....	30,000
Styrene Butadiene Rubber .....	40,000
Benzene .....	154,000
Para-xylene .....	100,000
Ortho-xylene .....	20,000
Cumene .....	150,000

By September 1976 landfill operations to raise the project's 160 hectare site by about 2 meters and detailed engineering had been completed, and several process agreements had been signed. Actual construction was scheduled to begin before the end of the year. The Japanese firms involved have undertaken to build the project for a total cost of slightly over \$1.8 billion. Parts of the project may have to be scaled down somewhat to meet this budget. Major contractors on the project are the Japanese firms Chiyoda Chemical Engineering & Construction Co. Ltd., IHI, Toyo Koatsu Industries Inc., Mitsui Shipbuilding & Engineering Co. Ltd and Hitachi Shipbuilding & Engineering Co. Ltd.

**Iran-Nippon Petrochemical Company (INPC).**—INPC is a 50–50 joint venture between NPC and a Japanese group consisting of Nissho-Iwai and Mitsubishi Chemical Industries K.K. Construction of the first phase of the INPC project, which entails production of 23,800 tons/yr of phthalic anhydride and 40,000 tons/yr of DOP plasticizer, was completed and start-up procedures underway in 1976. The plant is located in Bandar Shahpur. A second phase is planned to produce 2-ethyl hexanol, a raw material for the production of DOP. This raw material will be imported during the initial years of operation of the first phase. The ethylene and propylene feedstocks for INPC's 2-ethyl hexanol plant are ultimately to come from IJPC; thus timing of INPC's second phase will depend on the timing of the IJPC project.

Letters of intent have been issued by the NPC, and plans are under development for an additional number of petrochemical plants producing a wide variety of petrochemical products. These projects include plants for the production of caprolactam;

aromatics and olefins; melamine, fertilizers and other products. Implementation of these projects will hinge on the availability of financing.

**Aromatics at Abadan Refinery.**—As of late 1976, plans were advancing for construction of an 800,000 tons per year aromatics plant at the Abadan refinery, which would be owned by NPC and operated by the refinery. The NPC had selected the technology for this project, some basic design had been done, and discussions had been held with a number of contractors. Process agreements had been signed with Union Oil Co. of California (U.S.), Universal Oil Products Co. (U.S.), and Tatoray (Japan), while discussions on process contracts with Englehard Minerals & Chemicals Corp. (U.S.) and IFP (France) were well advanced. Benzene and xylenes from this plant would provide feedstocks for other NPC projects.

This aromatics plant is of highest priority among NPC's new projects and plans; nevertheless, implementation could be slowed by lack of manpower and problems of financing.

**Nitrogen Fertilizer.**—NPC has plans to build a complex at Neka on the Caspian seacoast to manufacture the following products:

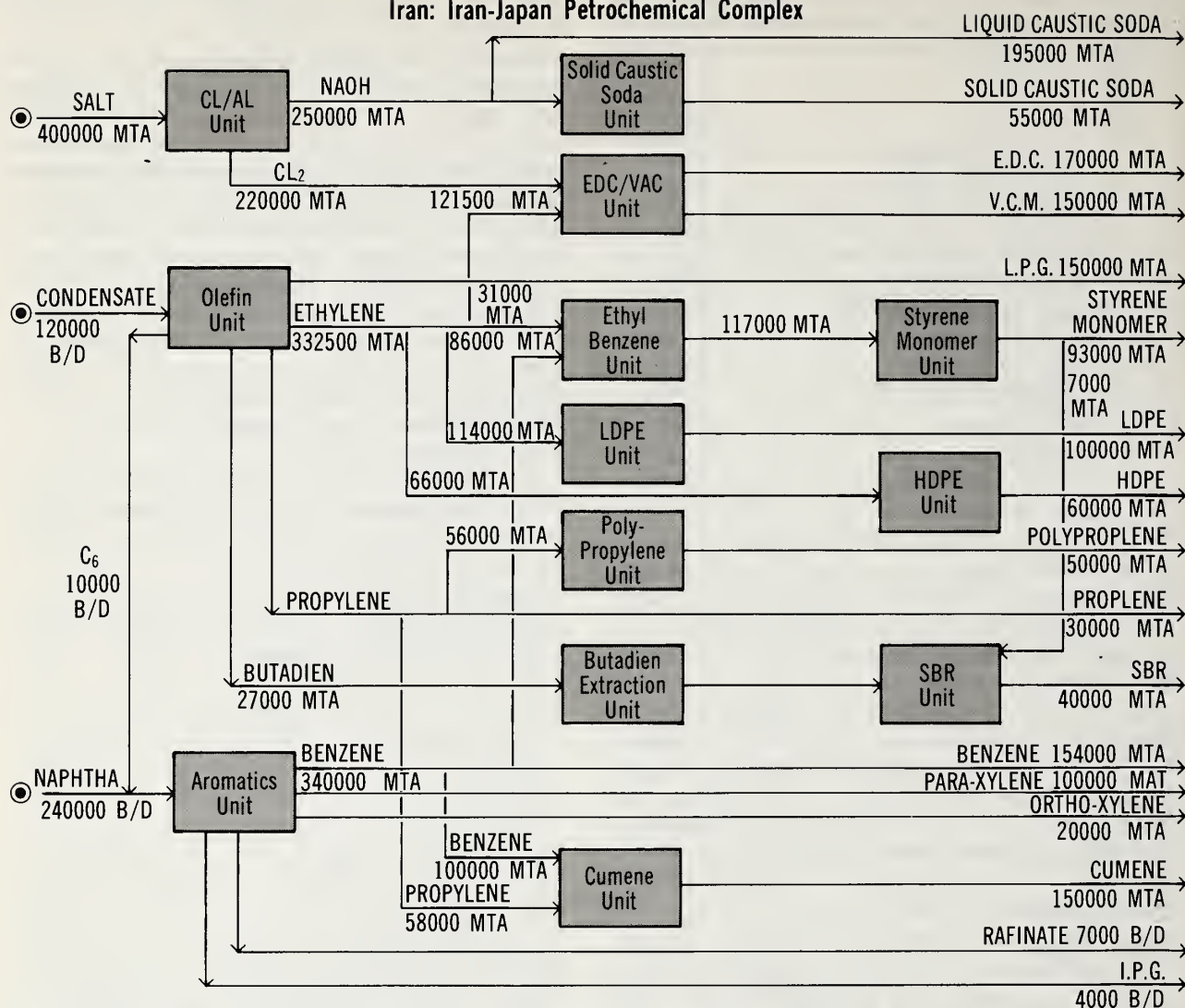
(annual production in tons)	
Ammonia .....	500,000
Urea .....	525,000
NPK .....	415,000
DAP .....	315,000

The complex would be built in three phases, beginning with ammonia and urea units, and followed by DAP and NPK units. Two important factors form the basis of this project, namely (a) its strategic location with ready access to three vital agricultural zones (Caspian, Azarbaijan and Khorassan), and (b) the fact that natural gas feedstock for its ammonia unit will come from the Sarakhs-Neka project, which is already underway. Progress on the project has been delayed, however, due to a somewhat slower increase in fertilizer demand than had been expected and to delays in the Sarakhs-Neka project.

NPC has signed letters of understanding with Anic S.p.A. (Italy) and Gardinier (France), and has held discussions with Sahu Jain (India), for the establishment of nitrogen fertilizer industries in the south of Iran. The letter of understanding with Anic calls for production of 1,400 tons/d of urea and 500 tons/d of ammonia nitrate, while the understanding with Gardinier involves production of 350,000 tons/yr of ammonia. These three projects are in suspense pending confirmation of the size and composition of natural gas discoveries in the south and decisions on the amount of gas that may be needed for gas injection and other projects.



**Figure 1**  
**Iran: Iran-Japan Petrochemical Complex**



Source: "Petrochemicals in Iran, Past, present and future", a paper presented to the European Management Association by M. Touhedi, June 24, 1974

**Caprolactum, DMT, Acrylonitrile and Methyl Methacrylate.**—NPC, held discussions with Bayer AG and Dynamit-Noble A.G., both of West Germany, and other foreign firms on joint ventures to produce these chemicals. Initially NPC considered building one wholly owned complex, purchasing technology and technical assistance from foreign firms, but subsequently decided to attempt its construction with the participation of the Iranian private sector development banks.

**Olefins/Aromatics and Alcohols.**—During 1974 NPC signed letters of understanding for 50-50 joint ventures with three U.S. firms and groups: Dow Chemical (Europe) subsidiary of Dow Chemical Corp. (U.S.), for an olefins/aromatic complex; Union Carbide Corporation (U.S.) for a complex to produce ethanol, isopropanol and ethylene glycol; and with the U. S. firms Phillips Petroleum Corp.,

Ashland Oil Corp., and B. F. Goodrich Chemicals Co., (collectively known as P.A.G.) for an olefins/aromatics complex.

At one point, NPC considered restructuring the projects as follows: core olefins and aromatics units would be dropped from the Dow and P.A.G. projects; the aromatics component would be entirely eliminated from the Dow project; NPC would build a wholly owned olefins plant to supply olefin feedstocks to these two projects, and supply basic aromatics to P.A.G. from its Abadan refinery aromatics plant. All three ventures would be subject to the Iranian Government's new 35% ceiling of foreign equity in high-technology ventures. Industry sources indicate that as of early 1977 the final decision had not yet been made on whether to proceed on any of these three projects.

NPC has discussed a joint venture to produce

300,000 tons/year of industrial methanol on Kharg Island with a Japanese consortium led by Marubeni Ltd. Implementation of this proposed project has been delayed pending certification of the gas supply situation on Kharg Island and the completion of market studies. There would appear to be sufficient tail gas available from Kharg Chemical Company to supply this smaller project (originally proposed by 1980. The large increase in capital expenditures templated) but in early 1977 implementation of the project still awaited completion of the market studies.

**Single Cell Protein.**—NPC and Imperial Chemical Industries Ltd. (ICI) (U.K.) have conducted preliminary studies for a joint venture to produce 170,000 tons/yr of methanol, most of which would be converted to 50,000 tons/yr of single cell protein for animal feeds.

Other NPC projects include a 200,000 bbl/d NGL fractionalization plant to process natural gas liquids that will be available in early 1978 from gas injection projects; a joint venture with Chemi Linz AG. (Austria) to produce 16,000 tons/yr of melamine; a joint venture with Lubrizol Corp. (U.S.) to produce 80,000 tons/yr of additives; and a joint venture with the Egyptian Government to build a fertilizer factory producing urea, TSP and DSP. NPC was also considering a joint venture to produce catalysts for domestic consumption.

There are a number of private firms engaged in projects for manufacturing intermediate and final petrochemical products, and two major private projects were underway as of late 1976.

Polyacryl Iran Corp. a joint venture formed by E. I. Du Pont de Nemours & Co. (U.S.) and the Behshahr Industrial Group is building a \$280 million polyester (staple and filament) and acrylic (staple) fiber production plant in Esfahan. The plant will produce 42,000 tons/yr of synthetic fiber when it starts production in 1978 (see Textile and Apparel Manufacturing). Plans call for a subsequent expansion to 100,000 tons annual capacity.

Persepolis Industrial Resins Company, a joint venture between a private Iranian group (40%), the Industrial Credit Bank of Iran (20%), and Industrial Plastics Limited (U.K.) (40%), is scheduled to produce the following plastics and resins when production begins in 1977:

	(tons/yr)
Formaldehyde (37%) .....	35,000
Urea/Formaldehyde and Melamine/Formaldehyde Molding Compounds .....	10,000
Urea/Formaldehyde Resins (Powder) .....	6,000
Phenol/Formaldehyde Resins (Powder) .....	5,000
Phenol/Formaldehyde Molding Compounds .....	5,000

The plant is under construction near Shiraz refinery. Other projects include: Irano-Garb group of companies to manufacture 30,000 tons/yr of various grades of polystyrene; Sherkat-e-Aliaf, whose plant is located between Tehran and Karaj and manufactures nylon-6 from imported caprolactum, to expand its annual capacity from 6,000 tons to 10,000 tons; and Parsilon, another private Iranian firm, to construct a 16,000 tons/yr Nylon-6 plant at Khorramabad.

**Refinery Projects.**—Construction of the 80,000 bbl/d Tabriz refinery was begun by Snam-Progetti S.p.A. (Italy) in June 1975 and was due to begin production by mid-1977. Fluor Iran, subsidiary of Fluor Corp. began construction at the Abadan refinery of an expansion project to increase throughput capacity by 130,000 bbl/d of crude oil. The expansion includes installation of new atmospheric and vacuum distillation towers. The project was to begin production in March 1977. The contract for the construction of a 200,000 bbl/d refinery at Esfahan was awarded to a joint venture of Fluor Iran and Thyssen Rheinstahl Technik in mid-1975. Projected completion date is 1979. In 1976 a "debottlenecking" project was in progress to add 20,000 bbl/d of capacity to the first unit of the Tehran refinery, and plans were underway for a similar project to add 20–50,000 bbl/d capacity to the second Tehran refinery unit. These projects would raise the total capacity of the Tehran refinery to 240–270,000 bbl/d. NIOC had plans for construction of another domestic refinery, and studies of refining needs were being conducted by Exxon Corp. (U.S.), Standard Oil Co. of California (U.S.), Foster-Wheeler Corp. (U.S.), and IFP (France). The refinery will probably be built near Tehran with a capacity of about 250,000–300,000 bbl/d. The NIOC is participating in several refinery projects overseas, including a 60,000 bbl/d refinery in Dakar, Senegal (a 50–50 joint venture partnership company with the Government of Senegal) and a 60,000 bbl/d refinery in Onsan, South Korea (a 50–50 joint venture with Ssang Yong Company).

In 1976 NIOC and Royal Dutch Shell were negotiating on the formation of a new venture to construct a 100,000-ton annual capacity lubricating oils refinery (possibly to be expanded to 200,000 tons/yr), which would be located at Abadan. NIOC hopes to export a part of the production of this proposed plant.

## GROWTH PROSPECTS

In Iran's revised Fifth Plan, expenditures in the petrochemical industry were projected at over \$860 million, of which one-half was expected to come from the NPC revenues and the remainder from



private and foreign sources. Over \$951 million was actually spent during 1973-75, and investment in petrochemicals is expected to be \$1 billion annually by 1980. The large increase in capital expenditures is indicative of the emphasis being placed on the greater utilization of Iranian gas and oil reserves.

The sheer size of Iran's financial commitment has strained Iran's short-term capital availability and hindered the Government in concluding agreements for many new plants that are under negotiation. It took a \$718 million loan from the Japanese Government to move negotiations for a large petrochemical complex off dead center. Increasingly, such joint venture projects will depend on the financing provided by the foreign investor. The Government hopes that the potential return on investment in petrochemicals will be so high that foreign companies will invest despite limitations on their equity positions. Iranian authorities recognize the competitive advantages Iran has for the manufacture of various petrochemical products. Iran possesses adequate petrochemical feedstocks, sufficient capital to invest in these highly capital-intensive chemical plants, and also access to export markets for its excess petrochemical output.

Domestic fertilizer production will more than satisfy domestic demand by 1980, when consumption is expected to reach about 1 million tons. The Iran Fertilizer and Shapur Chemical expansions will increase fertilizer production capacity by more than 1.1 million tons when they are completed in 1978; thus there will be substantial amounts of fertilizer available for export. New petrochemical projects planned to begin production by 1980 will produce basic petrochemicals and intermediates for exports.

New refineries under construction at Esfahan and Tabriz plus expansion projects at operating refineries will increase refinery capacity by some 480,000 bbl/yr by 1980. This will exceed Iran's domestic consumption, and excess production will be exported.

Growth of Iran's chemical industries is considered vital for the continued expansion of the country's manufacturing industries and agriculture. Foreign exchange earnings from exports of petrochemicals in future years are also planned to benefit the country when oil available for export decreases due to growing domestic demand and depletion of oil reserves. The large investments in Iran's petrochemical industry have already put it in a prominent position among the nation's industries. However, the country's continuing dependence on external sources for basic, nonpetroleum based industrial chemicals may constitute a serious long-term problem.

## CAPITAL GOODS MARKET

The continued expansion of Iran's chemical and petrochemical industries resulted in growth of the market for chemical process equipment, controls, and instrumentation from \$28 million in 1973 to over \$75 million in 1975 (see table 7). These figures do not include equipment such as pipes, steel plate and other standard construction items. The increase is directly attributable to new petrochemical projects or expansions of existing facilities implemented since March 1973. Separators and filtering equipment used in oil refineries and petrochemical processing plants made up 30% of all equipment purchases. Sales of cocks, valves and other equipment which are used extensively in multiproduct production plants totaled over \$8.8 million in 1975, representing 14% of 1975 demand. Items included in the category of "other machinery and equipment," such as prefabricated distillation towers, vats, collection vessels and compressors made up almost 27% of all equipment sales in 1975. Purchases of oxygen meters, gas flow meters, high pressure gauges and similar instruments amounted to \$3.2 million in 1975.

By 1980 the total market for equipment used in Iran's chemical and petrochemical industries is expected to grow to over \$177 million, an average annual growth rate of 18.5% during 1975-80. This

**Table 7.—Iran: Size of the Market for Chemical Industries Process Equipment, Instrumentation and Controls**  
(in thousands of U. S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>2</sup>
<b>PUMPS</b>					
Domestic Production ..	100	130	100	170	600
Imports					
United States .....	1,718	2,415	4,115	3,600	6,500
West Germany .....	1,245	2,596	5,165		
United Kingdom ....	795	914	2,276		
Italy .....	684	1,079	1,553		
Others .....	825	1,599	3,876		
Total .....	5,267	8,603	16,985	13,000	23,000
Total Market .....	5,367	8,733	17,085	13,170	23,600
<b>CONTROL AND MEASURING INSTRUMENTS</b>					
Domestic Production ..	—	—	30	50	250
Imports					
United States .....	713	887	1,383	1,800	4,700
United Kingdom ....	541	669	952		
West Germany .....	345	449	654		
Others .....	118	455	256		
Total .....	1,717	2,460	3,245	3,800	5,900
Total Market .....	1,717	2,460	3,275	3,850	6,150
<b>COCKS, VALVES AND SIMILAR EQUIPMENT</b>					
Domestic Production ..	40	90	150	200	600
Imports					
United States .....	628	877	1,736	3,400	5,800
West Germany .....	1,249	1,727	2,123		
Italy .....	586	1,040	1,644		
Others .....	2,453	3,470	3,106		
Total .....	4,916	7,114	8,609	19,100	33,000
Total Market .....	4,956	7,204	8,759	19,300	33,600

**Table 7.—Iran: Size of the Market for Chemical Industries Process Equipment, Instrumentation and Controls—Continued**

(in thousands of U. S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>SEPARATORS AND FILTERING EQUIPMENT</b>					
Domestic Production ..	—	—	—	—	—
Imports					
United States .....	2,092	1,907	4,992	4,650	12,000
West Germany .....	1,393	5,896	12,210		
United Kingdom .....	899	805	2,059		
Japan .....	302	668	1,821		
Others .....	341	1,194	3,988		
Total .....	5,027	10,470	25,070	36,800	52,000
Total Market .....	5,027	10,470	25,070	36,800	52,000
<b>OTHER CHEMICAL PROCESS EQUIPMENT</b>					
Domestic Production ..	—	—	—	—	3,500
Imports					
United States .....	2,135	2,412	4,105	4,300	7,000
United Kingdom .....	1,218	1,870	3,732		
West Germany .....	1,730	2,917	4,854		
Japan .....	832	1,212	1,997		
Others .....	5,407	8,025	7,067		
Total .....	11,322	16,436	21,755	27,000	59,000
Total Market .....	11,322	16,436	21,755	27,000	62,500
<b>TOTAL MARKET FOR CHEMICAL INDUSTRIES EQUIPMENT</b>					
Domestic Production ..	140	220	280	420	4,950
Imports					
United States .....	7,286	8,498	16,331	17,750	36,000
West Germany .....	5,962	13,585	25,006		
United Kingdom .....	3,653	4,558	9,323		
Japan .....	1,374	2,249	4,239		
Italy .....	1,773	2,464	3,639		
Others .....	8,201	13,729	17,126		
Total .....	28,249	45,303	75,944	99,700	172,900
Market Size .....	28,389	45,523	75,854	100,120	177,850

<sup>1</sup> Estimated.

Source: United Nations, Organization for Economic Cooperation and Development, supplier country and official Iranian trade statistics; estimates based on trade interviews.

increase will be due to the continued high level of investment in new plants and equipment. In 1975 domestic production of chemical process equipment, controls and instrumentation was less than 1% of industry requirements.

## Imports

West German suppliers have been the leaders in supplying equipment to the Iranian chemical and petrochemical industries. In 1975 over one-third of all imported equipment used in these industries was supplied by West German manufacturers, who made especially large sales of filtering equipment used in the manufacturing of petrochemicals, paints and other chemical products. Almost one-half of all West German-supplied equipment was in this category. West German firms were also the leading suppliers of anticorrosive pumps.

U. S. suppliers in 1975 sold 20% of the market for chemical industries equipment. U. S. firms in-

creased their sales from \$7.2 million in 1973 to \$16.3 million in 1975. U. S. suppliers' sales of chemical equipment doubled from 1974 to 1975, due in part to the role played by U. S. firms in the design and construction of new industry facilities. U. S. suppliers furnished 43% of the measuring and control instrumentation and one-quarter of all the pumps sold to the Iranian chemical industries in 1975. The market share of U. S. suppliers is expected to drop to about 11% by 1980, while the market share of Japanese suppliers will grow as a result of the construction of several large petrochemical projects which include Japanese investors.

Equipment suppliers from the United Kingdom accounted for 12% of the market in 1975. Over one-third of their sales were high-and-low-pressure compressors used in petrochemical refining, and 50% of remaining sales were of pumps, separators and filtering equipment supplied to private and government petrochemical projects. In addition, suppliers from the United Kingdom sold nearly \$1 million worth of measuring and control equipment.

Iranian imports of chemicals have been growing at a very high rate since 1970. Imports of chemicals rose from \$253 million in 1973 to almost \$600 million in 1975 (see table 8). The largest portion of this increase consisted of fertilizers, imports of which rose from \$279,000 in 1973 to over \$50 million in 1975. Plastics materials imports rose from \$66 million in 1973 to \$126 million in 1975. Chemical imports are expected to continue to grow at 15–20% per year until at least 1980 when the total import market for various chemicals will reach over \$1 billion.

## Domestic Manufacturing

Large government firms and private chemical processing companies rely primarily on imported equipment. The Government has been attempting to develop a domestic capability for the production

**Table 8.—Iran: Imports of Chemicals**  
(in thousand of U.S. dollars)

Type of Chemical	1973	1974	1975
Organic chemicals .....	29,581	56,143	61,987
Inorganic chemical elements oxides and halogen salts .....	6,466	14,657	15,067
Other inorganic chemicals .....	10,403	19,503	28,692
Mineral tar .....	173	525	304
Dyeing and tanning material .....	955	1,715	1,373
Pigments, paints and varnishes .....	12,272	17,984	22,319
Medicinal and pharmaceutical products ..	71,838	108,699	151,973
Essential oils and perfumes .....	2,298	3,146	4,724
Perfumery and cosmetics .....	1,477	2,144	3,511
Soaps, cleansing and polishing preparations	4,264	8,560	10,007
Fertilizers .....	279	7,657	50,630
Explosives and pyrotechnic products .....	8,497	11,690	15,849
Plastics materials .....	66,161	99,038	126,202
Chemicals, NES .....	38,732	75,611	100,838
Total Imports .....	253,396	427,072	593,475

Source: Official Iranian trade statistics.



of process equipment for chemical and petrochemical plants through investments by the government investment and holding company Industrial Development and Renovation Organization (IDRO). The IDRO subsidiary Arak Machine Manufacturing Plant produces pressure vessels, heat exchangers and industrial boilers under license from leading U. S. and European firms. IDRO has also established Acrowsa, Iran, a joint venture with British interests for the establishment of a plant to manufacture pressure vessels, heat exchangers, storage tanks, columns, vertical and horizontal in-line pumps for the oil, petrochemical and gas industries. Another joint venture between International Compressed Air Corp., Ltd. (CompAir) of the United Kingdom and the IDRO subsidiary Machine Sazi Tabriz will produce high-and-low-pressure compressors.

## MARKET OPPORTUNITIES

The development of Iran's petrochemical industry through large petrochemical projects will require significant amounts of technology, equipment, engineering services and other assistance from abroad.

**Petrochemical Processing Equipment.** — Iran's petrochemical projects will require fabrication or importation from abroad of various types of slurry and acid pumping equipment, heavy-duty gate valves, atmospheric and vacuum-type distillation equipment, "cracking," desalting and dewaxing equipment, and other refining equipment and structures. High-pressure chemical feeding compressors as well as low-pressure air compressors of 5,000 cubic feet per minute or less will also be required. While most of this equipment is obtained in connection with projects, there is a growing market for replacement equipment for refineries, fertilizer plants and other established installations.

**Other Equipment.**—The growth in the number of Iranian plants producing industrial chemicals, pharmaceuticals and proprietary chemical products, as well as plastics, resins and other synthetics from intermediates produced by Iran's petrochemical plants, will require a wide range of process equipment including vats, reactors, separation equipment, batching and blending equipment, distillation and filtering units, extrusion and moulding equipment, as well as pumps, valves, controls and instrumentation. There will also be opportunities for sale of turnkey plants in these industries.

**Controls and Instrumentation.**—A large amount of instrumentation such as pressure gauges and chart recorders, gas detection and liquid flowmeters, temperature-related equipment and other metering equipment will be required in Iran over the 1976-86 period. It is likely that there will be increased use of electronic, digital readout and continuous moni-

toring devices for process control.

**Services and Technology.**—In the development of the petrochemical industry, NPC and other Iranian producers will continue to look to foreign sources for process technology and plant design through joint ventures, licensing, and technical services agreements. Most new plant construction and expansions of existing facilities will be handled by prime contractors with responsibilities for design, procurement and construction.

## MARKETING ENVIRONMENT

### Buyers Universe

The National Petrochemical Company (NPC) is the purchaser of 95% of all chemical process equipment used in Iran. Its headquarters is located on Karim Khan Zand Avenue at the corner of Roosevelt Avenue in Tehran. All new petrochemical plants are under the direct control of this state corporation. The NPC normally purchases through selective tenders, in which technical specifications are drafted with the assistance of foreign firms either in a joint venture arrangement or, more frequently, under technical assistance contracts. Equipment must be evaluated by the NPC before manufacturers can be placed on a list of qualified suppliers.

The National Iranian Oil Company (NIOC), headquartered on the corner of Takht-e-Jamshid Ave. and Hafez Ave. in Tehran, usually relies on consultants for equipment procurement and the design and construction of new facilities and expansions. This often includes the solicitation and evaluation of tenders.

The Plan and Budget Organization has instructed other government agencies and companies not to conclude turnkey contracts, but to award each segment of major projects in separate competitive bidding procedures for basic design, detailed engineering, construction management and procurement, and actual construction. Some confusion exists as to how these instructions apply in the case of some major projects, such as refineries, on which most clients normally prefer to have a single contractor responsible for several major segments of the work.

Suppliers and contractors to NIOC, NPC, and other state agencies are required to submit notarized affidavits naming any agents or representatives. NIOC reserves the right to determine whether payments to such agents or representatives are "reasonable" compensation for services rendered and to apply penalties if it learns that unreported payments are being made.

Most private chemical manufacturers rely heavily on joint venture partners for the procurement of equipment. In the case of domestically owned firms, procurement is often centralized in the hands of the proprietor who relies heavily on his own technical

expertise and the supplier's advice for selection of equipment.

## Foreign Supplier Universe

There are a large number of suppliers to Iran's chemical and petrochemical industries. Approximately 20 suppliers of equipment, controls and instrumentation used in the processing of chemicals and petrochemicals are represented in Iran through exclusive agency agreements with Iranian companies. Only a small number of firms, such as Honeywell Inc. (U.S.), have branch offices in the country.

Heavy equipment, such as high pressure compressors, is sold by Ingersoll-Rand Co., Pennsylvania Pump & Compressor Co., Dresser Industries and Chicago Pneumatic Tool Co. (all U.S.), as well as International Compressed Air Corp., Ltd. (ComAir) (U.K.) and Atlas-Copco AB. (Sweden). Ingersoll-Rand, ComAir and Atlas-Copco have excellent service facilities in Iran and also stock equipment locally. Other leading compressor suppliers are Brian Duncan Ltd. and Broom & Wade Ltd. (both U.K.) which sell low-pressure air compression equipment. Pumps are supplied by Goulds Pumps Inc. (U.S.), Rheinhuette, division of Ludwig Beck & Co. (West Germany) and Peerless-Iran Corp., division of FMC Corp. (U.S.) which, although it has an Iranian manufacturing plant, continues to import specialized pumps.

Valves, including specialty valves such as butterfly and gate valves for use in acid and petrochemical processes, are supplied by Pacific Pumps, Inc., division of Dresser Industries, Inc., Walworth Co., Garlock Inc. and Cameron Iron Works, Inc. (all U.S.), as well as Allis Wynn Ltd. (U.K.). W. Schuler GmbH (West Germany) is a major supplier of filters.

Taylor Instruments Ltd. (U.K.) and The Foxboro Co. (U.S.) supply most of the measuring equipment used in both private and government petrochemical plants. Honeywell Inc. (U.S.), which gained an excellent reputation through its large servicing and sales organization in Tehran, is the leading supplier of temperature measuring equipment.

Draiswerke GmbH (West Germany) is a major supplier of specialized equipment to the paint industry and Nuemo Ltd. (U.K.), supplies large amounts of filling equipment to the pharmaceutical industry. Injection molding equipment for the plastics industry is supplied by Neillinger GmbH and Scheller GmbH (both West Germany) which also supplies presses of all kinds.

Snam-Progetti S.p.A. (Italy); The Lummus Co.-Iran, Kellogg Iran Inc., Fluor Iran and Ralph M. Parsons Co. (U.S.); and Thyssen Rheinstahl AG. (West Germany) are leading design engineers and contractors for the building of oil refineries and petrochemical plants for the NIOC and the NPC.

## Marketing Factors

Because of the heavy emphasis on personal contacts in marketing, most foreign firms providing equipment and services to the Iranian chemical industries employ representatives permanently based in Iran. Due to the key role played by joint ventures and foreign technical service contractors, much of actual procurement of equipment for refineries, petrochemical plants, and other large projects is done through overseas offices. Prime contractors often subcontract supply and installation of equipment and components to suppliers as part of an overall project.

A number of foreign firms, particularly in the design and engineering field have successfully established joint venture arrangements with Iranian firms. Several manufacturers of pumps, valves, compressors and process structures have either licensed designs to Iranian private and state firms, or established joint ventures for local production. As these domestic production activities become operational they may enjoy a considerable advantage in supplying public sector firms.

## COMPETITIVE POSITION OF U.S. SUPPLIERS

The major U. S. firms active in the chemical industries have entered the Iranian market through joint ventures technical service contracts or supply of equipment and services. U. S. firms are leading suppliers of process technology for refineries and petrochemical plants, many through licensing agreements. Good sales opportunities exist for U. S. manufacturers of specialized chemical process equipment, instrumentation and control equipment, but their access to the market is often best achieved by subcontracting on major projects. Some "turnkey" sales opportunities also exist in subsidiary and secondary industries of the chemical/petrochemical field, primarily in private sector projects.

Of growing importance for the chemical industries as a whole is the increased attention Iran is giving to prospective joint venture partners who are able to hold a substantial equity portion of a project, or who offer attractive financing for the equipment and services required. Japanese suppliers are expected to benefit from the major joint venture petrochemical projects being undertaken by Japanese firms; while the future sales of U. S. suppliers are likely to be influenced by decisions on several pending projects involving substantial investments by U. S. firms. To overcome the projected decline in U.S. sales, American suppliers will have to intensify their marketing efforts, particularly among non-U. S. investors, and seek participation in international consortia bidding on major projects.



# Communications

IRAN'S COMMUNICATIONS systems were expanded dramatically in the 1966-76 period. A new integrated telecommunications network and international satellite communications were introduced, and a major expansion of the telephone network was completed during this time. Investment in communications will continue at high levels during the 1976-80 period. Major projects include telephone service expansion, telex switching stations, post office expansion, and gas pipeline microwave systems. A domestic telecommunications satellite system is also being planned to be operational in the early 1980's.

Total expenditures for communications equipment in Iran rose from \$178 million in 1973 to over \$334 million in 1975. By 1980, total equipment sales are expected to be \$559 million. United States suppliers sold 26% by value of all imported communications equipment in 1975; West German and Japanese suppliers were their major competitors.

Nearly all types of telecommunications equipment will sell well during the 1975-85 period due to the continuing expansion of the Iranian communications networks. The planned domestic satellite system will require a wide range of associated equipment and services. Electronics components, production and test equipment will be in demand by the emerging domestic electronics industry.

## SYSTEM STRUCTURE AND SIZE

All significant communications systems in Iran are owned and operated by Iranian government agencies. Communications systems and devices are under the direct control of the Ministry of Posts, Telephone and Telegraph (PTT), the Telecommunications Company of Iran (TCI), and the Ministry of Information.

**The Ministry of Post, Telegraph and Telephones (PTT).**—The Ministry, located at Sepah Square in Tehran, is responsible for overall telecommunications policy. The Ministry also operates and maintains all postal, telex and telegraph services. Permission to purchase postage equipment or to install telex lines, for example, must be obtained from the Ministry. This organization is empowered to expand facilities, set subscriber charges and collect fees for those services under its control.

### **The Telecommunications Company of Iran (TCI).**

—This state corporation, located on Kourosh-Kabir Avenue opposite Chahrarrah Ghaz, Tehran, was originally a department of the Ministry of PTT. Since 1974 TCI has been a completely autonomous government agency with its own budget and staff. It is responsible to the PTT for policy decisions only. TCI has jurisdiction over the planning, execution, and maintenance of the country's telephone and microwave networks (except that of the National Iranian Oil Company (NIOC) and the military networks). Through a subsidiary organization, the Telephone Development Project, TCI in 1976 was administering a project for the modernization of the country's central office telephone exchanges. Another department of TCI, the Project Management Office (PMO), operated most of the 660 microwave sites located throughout the country.

**Ministry of Information.**—Commercial and industrial, non-broadcast radio and other telecommunications such as mobile radios, transmitters, and receivers of all types are tightly controlled by the Ministry of Information which is located at the corner of Abbassabad and Mahnaz in Tehran. Approval for all such communications networks, both government and private, must be obtained from this Ministry. Private use of two-way radios is extremely limited, and very few licences for operation of mobile radios, paging systems and other nonbroadcasting equipment have been granted.

Radio and television transmission is the responsibility of the National Iranian Radio and Television Organization (NIRT), headquartered on Jam-Jam Avenue in Tehran. All FM and AM radio and television broadcast stations and transmitters are owned and operated by this government organization. Through 1976 there was a U.S. Armed Forces radio and television broadcasting station in Tehran, operated under a special agreement with the Iranian Government, but NIRT took over its operation in October 1976. In 1977 there were no privately owned radio or television broadcasting facilities in Iran.

Total capital expenditures for communications systems equipment in Iran were over \$1.5 billion

**Table 1.—Iran: Capital Expenditures for Communications Systems**  
(in millions of U.S. Dollars)

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>GOVERNMENT AGENCIES</b>						
Telecommunications						
Company of Iran .....	120.0	197.1	117.5	152.5	197.4	130.0
Ministry of PTT .....	55.0	67.4	90.9	97.7	68.0	70.0
Civil Aviation Authority ..	3.5	3.7	16.7	17.0	28.4	12.0
Ministry of War .....	30.3	38.1	105.6	142.2	160.4	190.0
National Iranian Radio & TV .....	1.0	.9	1.4	1.9	2.0	2.5
Other Agencies <sup>2</sup> .....	27.0	35.0	37.5	44.0	46.0	50.0
<b>TOTAL</b> .....	<sup>3</sup> 236.8	<sup>3</sup> 342.2	<sup>3</sup> 369.6	<sup>3</sup> 455.3	<sup>3</sup> 502.2	454.5
<b>PRIVATE AGENCIES</b>						
Industry .....	16.0	35.0	37.0	42.0	48.0	70.0
Schools and Universities ...	3.3	5.2	6.2	6.8	8.1	9.0
<b>TOTAL</b> .....	<sup>4</sup> 19.3	<sup>4</sup> 40.2	<sup>4</sup> 43.2	<sup>4</sup> 48.8	<sup>4</sup> 56.1	<sup>4</sup> 79.0
<b>Total Capital Expenditures</b> ..	256.1	382.4	412.8	504.1	558.3	533.5

<sup>1</sup> Estimates.

<sup>2</sup> Other agencies include Gendarmarie, police agencies and quasi-government organizations.

<sup>3</sup> Derived from official budget figures.

<sup>4</sup> Derived through trade interviews.

Source: Official Iranian Budgets; estimates based on trade interviews.

during the 1973–75 period (see table 1). Of this amount 42% was allocated for the expansion of the telephone and microwave network and an additional 23% was spent in the expansion of telex and telegraph facilities. In 1976 an estimated \$455 million was budgeted by government agencies, and private institutions invested an additional \$48.8 million for the expansion and utilization of communications systems. Consumer expenditures on television,

radio, and other electronics items rose from \$127 million in 1970 to \$237 million in 1975. There are an estimated 50,000 people employed in domestic manufacturing plants and government agencies engaged in expanding and maintaining the country's communication services.

**Postal Services.**—The Iranian Postal Service is one of the country's oldest governmental institutions. It was during the reign of Darius the Great (King of Persia 522 B.C.—480 B.C.) that the classic phrase was coined "neither rain nor snow nor gloom of night shall stay these couriers from the swift completion of their appointed rounds". In 1976 Iran had 1,844 post offices, an estimated 10,000 post office boxes for mail delivery and over 6,000 postmen. While only 6% of all post offices are located in Tehran, over 24% of all postmen work in the capital city. In addition, there were an estimated 40,000 private messengers employed by offices and businesses in Tehran to handle delivery of business communications. In 1975, the government-run postal services handled almost 600 million letters and parcels using only manual equipment for sorting and letter handling (see table 2).

**Telex and Telegraph Services.**—There were over 16,000 telex machines in the country during 1976, more than 75% in Tehran and the remainder primarily in the large cities, notably Mashhad, Tabriz, Shiraz, and Ahvaz. The Ministry of PTT was handling over 350,000 international telex transmissions annually and 30,000 internal communications mes-

**Table 2.—Iran: Development of the Communications Sector 1970–80**

	Units	1970	1973	1974	1975	1976	1980
<b>Basic Communications Traffic</b>							
Postal .....	millions	251	423	498	597	735	1,200
Telegram, Domestic .....	thousands	7,722	10,300	11,715	12,000	12,300	14,500
Telegram, International .....	thousands	498	370	355	350	365	420
Telephone .....	thousands	7,385	8,645	9,130	9,489	10,200	16,300
Telex .....	thousands	84	260	312	385	525	1,200
<b>Broadcast Communications</b>							
<i>Radio</i>							
Set population .....	millions	3.0	3.8	5.2	6.4	8.0	12.5
National coverage .....	percentage	50	81	99	100	100	100
Number of radio transmitters .....	units	37	64	77	113	182	300
Power output of transmitters .....	kilowatts	1,152	7,710	7,852	10,000	14,300	23,000
<i>Television</i>							
Set population .....	thousands	200	730	1,130	1,560	1,980	3,300
National coverage .....	percentage	25	57	64	70	73	81
Number of TV transmitters .....	units	11	92	101	130	146	212
Power output of transmitters .....	kilowatts	68	140	141	152	165	280
<b>Telecommunications</b>							
Telex installations .....	thousands	6	11	13	15	16	25
Telephone installations .....	thousands	280	430	560	630	700	1,050
<b>Capital Investment</b>							
Expenditures for communications by government and private agencies .....	millions of U.S. Dollars	256.1	382.4	412.8	504.1	558.3	533.5
<b>Consumer Electronics</b>							
Expenditures for radio and TV, other consumer electronics equipment .....	millions of U.S. Dollars	127.0	208.0	219.0	237.4	255.5	255.0

Source: Official statistics from NIRT, TCI, Ministry of PTT; estimates based on government programs; consumer expenditures reflect trade sources.



sages daily in the mid-1970's. Each of the existing 10 telex exchanges, all located in Tehran, has two computers installed to provide more efficient routing. The introduction in 1974 of satellite telex transmission has brought telex service up to international standards. In addition to telex services, there are approximately 10,000 telegraph stations in the country which operate through a network of 588 main telegraph centers. Telegraph transmissions now make extensive use of the domestic microwave network. Most of the telegraph equipment is of European origin. Service is efficient and same-day delivery of telegrams is standard throughout the country.

**Telephone Network.**—In 1973 there were 430,000 telephones installed in the country. In 1975 the Telecommunications Company of Iran budgeted \$150 million for a project to provide additional switchgear equipment in 500 large central office exchanges, and by mid-1976 a total of 700,000 telephone numbers were in service. Systems installed in the 1950's and early 1960's by Siemens AG. of West Germany are now being replaced by higher capacity cross-bar technology equipment from General Telephone & Electronics Corporation of the United States. In 1975, Iran had 2,244 automatic domestic telephone channels in use between cities and 63 channels for international calls, 80% of which were satellite links. In 1974, the PTT recorded over 9 million internal calls totalling 36 million minutes. The PTT estimated that this figure would double by 1977 due to the additional telephone installations scheduled to be made between 1975 and 1978.

There were an estimated 1,800 installed PABX systems in the country in 1976. Cross-bar PABX and trunk-connected intercom systems valued at an estimated \$24 million were installed during 1975. The bulk of the PABX systems had 81–200 lines and were located primarily in government organizations and large private companies. All subscriber telephone equipment is sold by private companies, and the PTT has jurisdiction only up to the trunk-line connection.

**Radio and Television Networks.**—The radio set population of Iran was estimated at 6.4 million in the mid-1970's. Ownership of radios grew an average of 16% annually in the 1970 to 1975 period. In 1975 there were 113 radio transmission stations and 30 radio broadcasting studios located in major cities throughout the country. In that year total transmission power of radio transmitters was 10,000 kW and for the first time in history, coverage extended to the entire country.

It is estimated that in 1976 television coverage reached over 70% of the Iranian population. There were just over 1.5 million television sets in the coun-

try, 45% in Tehran. New ownership of television sets has grown an average of over 50% yearly since 1970. The National Iranian Radio and Television Organization (NIRT) has a total of 146 television transmitters, 12 production studios, and operates three separate television channels including one carrying educational programming. The NIRT also operates booster power stations as well as 70 microwave relay stations to provide more extensive television coverage. Television broadcasting equipment used by the NIRT employs the French "Secam" system, with Sony Ltd. of Japan and Ampex Corporation of the United States supplying most of the cameras and broadcasting equipment. In 1976 regular color television programming was introduced into the country for the first time. During 1976, 40% of all programming on the first channel was broadcast in color. While much of the programming featured dubbed foreign productions such as "Days of our Lives," "Mission Impossible," "Six Million Dollar Man," and "Columbo," more local programming features such as variety and game shows as well as historical serials were being produced.

**Non-broadcasting Radio.**—The Government of Iran has placed very strict control over non-broadcasting radio communications. There are very few independent communications systems in industry, mining, or in transportation outside of State agencies. Government-owned marine shipping operations, the National Iranian Oil Company, the police, civil aviation, and the armed forces all operate radio communications networks. Police cars and motorcycle patrolmen are equipped with an estimated 3,000 mobile two-way radio systems from either Motorola, Inc. or General Electric Company (U.S.), while both military and civil aircraft are also equipped with radio transmitters. The Telephone Taxi Organization, which is government-owned, operates a fleet of 200 taxis in Tehran. They are the only taxis in the country that are radio dispatched and equipped with two-way radio systems.

**Telecommunications Network.**—The Government of Iran completed installation of a national microwave multiplex system in 1975. It provides an integrated national telephone, telex, and telegraph, radio and television reception capability by means of microwave, troposcatter, and open-wire networks. Some 58 cities and military bases are connected by 660 installation sites in the system. The open wire network has 12 major centers and seven minor centers with 160 service point terminals having both three and 12 channel carrier capacity. The microwave system contains telecommunications links for the Central Treaty Organization (CENTO) of which Iran is a member, running from Istanbul, Turkey through Tehran and into Pakistan; 40 multi-junction stations, 133 repeater stations, and numerous one

and two-way drop repeaters with UHF and VHF capacity. In 1976 the network consisted of 8,400 linked miles with 14,207 channel ends and some 10.8 million voice channels miles. Iran also has two earth satellite stations which link the system internationally.

Iran's first major telecommunication expansion, called the Integrated National Telecommunication System project, was begun in 1971. This system was installed by an international consortium (called GNPS) consisting of Page Communication Engineers division of Northrop Corp. (U.S.), General Telephone & Electronics Corp. (GTE) (U.S.), Nippon Electric Company (NEC) (Japan), and Siemens AG. (West Germany). Total cost of this project, completed in late 1975, was \$300 million. It consisted of building microwave relay stations throughout the country at 320 major and 229 minor sites and, at its height, employed 1,500 engineers and technicians. Another telecommunications project carried out at the same time was the Seven Links Project which linked up seven major cities of Iran by a microwave network. This project involved the building of 70 microwave stations at a total cost of \$35 million. In addition, an open wire carrier project was begun in 1970, implemented by TRT S.A. (France), Siemens AG. (West Germany) and NEC (Japan). This system, installed at a total cost of \$70 million, consists of multiplex equipment with a capacity of 9 and 12 channels.

In addition to the national telecommunications network, the National Iranian Oil Company (NIOC) operates an independent 35-station microwave system integrated into the national system and linking all the firm's operating elements with the company headquarters in Tehran. There is also a military telecommunications network that was integrated into the national system in 1974 and leases microwave lines from TCI, but the military remains fairly independent of the national system for both operations and funding purposes.

## TRENDS, PROGRAMS AND PROJECTS

Iran's communications system underwent a rapid modernization in the first half of the 1970's, both in terms of upgrading existing facilities and the addition of new communications networks for internal and international needs. A highly developed system of communications is clearly recognized as necessary if the country is to achieve its goal of becoming a modern industrial power in the Middle East. Moreover, obtaining the very latest in communications equipment is considered among the highest priorities by government planners.

Demand for all communications services has been rising rapidly and Iran's planners have been hard pressed to keep up with it. Only since the Fourth Development Plan (1968/69-1972/73) have sufficient allocations of financial resources been made available to communications agencies.

The amount of mail and parcels handled by Iranian post offices has been increasing annually since 1968, and was approximately 600 million pieces in 1975. In that year, the Shah established as an objective the improvement of the country's postal services so that letters mailed in a city with a population of 25,000 or more would be delivered within 48 hours. In order for the postal services to implement this goal, it has been necessary to completely re-evaluate methods of domestic mail distribution. In 1976, postal authorities had just begun a program to mechanize the main post offices and were constructing a fully automated main post office facility in southern Tehran. The Fifth Development Plan (1973/74-1977/78) calls for the introduction of mechanized sorting facilities in eight main postal centers. As of late 1976, mechanized equipment for only one of these centers had been put out to tender.

Iran's Fifth Development Plan called for the number of installed telephones to be expanded from 430,000 in March 1973 to over 2 million by March 1978. A \$2.5 billion contract was awarded for the implementation of this ambitious program in early 1975. By the end of 1976 installation of central exchange equipment was almost completed, but only 700,000 telephone numbers were in service. Internal telephone service improved steadily during the 1970's. By 1976 the system was up to European standards, although many lines were still overloaded. The further installation of electronic central switching equipment and a growth in line capacity is planned, in order to solve most of the problems of line overloads by the end of the Fifth Plan period in 1978.

The program to provide direct dialing connections between the most populated centers was progressing according to schedule in the mid-1970's. In 1973 there were 44 cities and towns that had direct dialing connections; by 1975 this number had increased to 73, which was over 80% of the planned total to be completed by 1978.

Until the late 1960's, PABX systems were used mostly in government offices. Both PABX systems and smaller trunk-connected intercom systems were in wide use by private business by the mid-1970's. In 1975 there were no electronic PABX systems being sold in Iran; all systems relied on cross-bar technology. Digital dialing systems for private telephones were introduced in late 1975. Because almost all central exchanges still utilize cross-bar technology, the new digital model telephones will have a



key pad to convert the impulses to the standard electrical mode compatible with the central switching system.

International telephone service has been improved since the early 1970's when a caller had to go to the central phone office and reserve a time to place a call overseas. By 1976 calls could be placed from residences. Although there is normally a wait of several hours for the call to be connected, the reception has improved greatly. In addition, the cost of placing a call overseas has dropped 30-40% from 1973 rates due to the satellite links established in 1974.

Iran's telex service improved greatly in the mid-1970's and telex communications are efficient and computerized. However, there is a shortage of telex machines in the country and there is a long waiting list for new connections. In 1976 it took an average of 6 months and sometimes as long as 10 months to obtain approval from the Ministry of PTT for the installation of a telex line.

The National Radio and Television Organization (NIRT), founded in 1967, has made great strides in expansion of television broadcasting quality and coverage. NIRT's original goal to reach 70% of the nation in television coverage was attained in 1975. By 1976 there were three television channels and in that year NIRT inaugurated both color programming and the country's fourth channel, the first educational program channel. During the mid-1970's reception clarity was improved and program scheduling was made more sensitive to the cultural traditions of Iran's population.

The number of radios in Iran increased from 3 million in 1970 to 6.4 million in 1975. Some of this increase was a result of the growth in the number of vehicles, almost all of which had radios installed. In addition, part of the increase has resulted from NIRT's greatly expanded radio transmission coverage, which has spread to virtually all parts of the country. Both AM and FM broadcasting are available to even remote nomadic desert tribes.

## Projects

In 1976 there were a number of communications projects planned or underway (see table 3). KDK Company Limited of Japan has a major contract to provide new telephone cable installations, repair underground telephone cables, and install new central office telephone exchanges for the Telecommunications Company of Iran. The project timetable called for 1.3 million new telephone installations by mid-1978, but the project has been extended to 1980. The General Telephone & Electronics Corp. (GTE) of the United States has another major contract with the Telecommunications Company of Iran to replace small exchanges with higher capacity equipment in over 500 locations. The estimated cost of this contract is in excess of \$500 million.

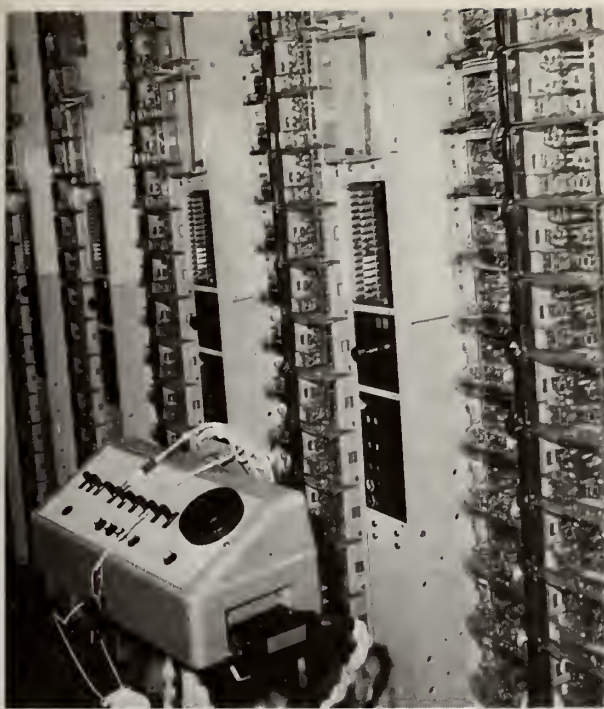
RCA Corp. (U.S.) was awarded an \$18 million contract in July 1976 to provide a 4,000-line telex switching center at the main telex terminal in Sepah Square, Tehran. RCA is providing the overall systems design and a computer system to be installed by General Electric Co. (U.S.). This project is the first in a series of 10 such exchanges to be installed; the other nine are to have capacities of 1,000 lines each. The Telecommunications Company of Iran has also awarded a \$30 million contract to General Electric Company of the United States for the building of an earth satellite station which will service the Indian Ocean region. This will complete Iran's East-West international communications links and is expected to make the country a center for world telecommunications.

In 1975 CFS Thomson S.A. of France was awarded a contract to build 35 microwave sites connected by PABX systems for the National Iranian Gas Company (NIGC) on Iran's IGAT-I gas line to the Soviet Union. This project, valued at \$12 million, is slated to be completed by 1978. It is expected that by 1980, with the completion of Iran's IGAT-II gas line (see chapter on Mining, Petroleum, and Natural Gas Extraction), another similar contract will be awarded for that gas line project.

*Table 3.—Iran: Communications Projects*

Type of Project	Agency Responsible	Value of Contract	Name of Implementing Co.	Date Awarded	Date of Completion
Telephone Expansion .....	TCI	\$1.5 billion	KDK-Japan GTE-USA	1974	1980
Earth Satellite Station .....	TCI	\$30 million	G.E.-USA	1975	1978
IGAT-I Pipeline Microwave System .....	NIGC	\$12 million	CFS Thomson	1975	1978
Telex Switching Station .....	TCI	\$18 million	RCA	1976	1978
Nine Telex Switching Stations .....	TCI	N.A.	N.A.	1977	1982
IGAT-II Pipeline Microwave System .....	NIGC	N.A.	N.A.	1978	1981
Post Office Mechanization .....	PTT	N.A.	N.A.	1977	1982
Domestic Telecommunications satellite system .....	PTT	\$200-500 million	N.A.	Tendering 1977	1981-83

Source: Project departments of NIGC, TCI, Ministry of PTT and NIRT and Fifth National Development Plan.



*Basic electromechanical equipment in use such as shown here is Tehran central office is being upgraded in a \$600 million project.*

The Ministry of PTT has a number of projects underway for the mechanization of the country's central post offices. By late 1976 only one contract for mechanization of the newly built central post office in Tehran had been signed. Another seven are expected to be bid upon in 1977 and 1978 as a result of international invitations to tender.

A major project for the future development of Iranian telecommunications is the plan for a domestic communications satellite system. Still in the formative stage in late 1976, the PTT Ministry, NIRT, and the Plan and Budget Organization were defining the details of the system. Primary functions of the project would be to facilitate educational television (see Education and Training Services report in this survey) and telephone services to remote village areas. It is estimated that the domestic telecommunications satellite would complement and expand the capacity of Iran's existing microwave system by a factor of three. The Government plans to call for tenders for the \$200-500 million project in 1977, with completion to be scheduled for 1981-83.

## **GROWTH PROSPECTS**

Mechanization of postal operations does not appear to be the only answer for improvement of postal services in Iran. In 1975 the postal service operated only 540 mail trucks and relied on contracts with bus

lines, the State Railway Organization and Pars Air Company for intercity mail delivery. Postmen normally used motorcycles for residential mail delivery. New towns being built in conjunction with industrial projects and the mobility of the labor force make more extensive use of intercity transportation methods imperative and a great many more vehicles should be added to the system. Since a substantial amount of mail is international, the postal service has a separate department for translation of foreign addresses; mail delivery is often delayed 2 to 4 days just for the translation process.

Improving the training of postmen is slated each year, but simply is not being implemented. A comprehensive training program by the postal authorities is needed. Moreover, the number of post offices and post office boxes are inadequate. To relieve crowding at post office facilities, more extensive use of small neighborhood post offices should be made, and an expansion in the number of post office boxes would relieve postmen of delivering mail to heavy users. Unless improvements are made, the projected heavy demand for mail service and the lack of properly trained personnel will cause further delays in mail distribution in the late 1970's and early 1980's.

While Iran had only a very small telecommunications system linking the southern part of the country with Tehran in 1965, by 1975 the planned national telecommunications network was relatively complete. Although maintenance and staffing problems for remote microwave sites exist, the goal of rapid transmission and reception of information from one part of the country to another has been realized. The proposed domestic telecommunications satellite system will significantly add to the capacity and flexibility of the existing system.

Although new telephone lines have been installed at a fast pace, private subscribers in 1977 still had to wait an average of 6 months. While this waiting period is far shorter than that experienced in the 1965-75 period, it is still considered unacceptable. The high demand for new telephone installations will result in increased use of PABX, trunk-connected intercom systems and telephone handsets in the country, but it may be well into the 1980's before Iran reaches its goal of 2 million telephones in operation throughout the country.

Complete radio coverage of Iran coupled with expanded coverage by television broadcasting should result in an increase in the numbers of television and radio receivers in use during the 1975-80 period. Television and radio programming should also improve in content. The number of programs domestically produced is expected to grow. The use of television for education and information purposes will expand during the late 1970's, spurred by the inauguration of the domestic satellite system in the early 1980's.



Non-broadcast two-way radio usage will continue to grow with the expansion of the government and military services, but the use of private two-way radio is expected to remain limited through 1980.

Consumer electronics equipment is expected to continue to be imported in increasing quantities despite high customs duties. It is expected that one or more of the international leaders in manufacture of consumer electronics products will begin assembly operations in the country before 1980.

## CAPITAL GOODS MARKET

During 1975, total sales of communications equipment in Iran were \$334 million (see table 4). Land line communications equipment, such as that used in telephone networks, accounted for 27% of this total while a third, or \$114 million, was spent on microwave and other telecommunications equipment. Almost one-fourth of all sales in 1975 were consumer electronics products such as television sets, radios, record players, and hi-fi audio equipment.

Sales of communications equipment grew at an average annual rate of 37% during the 1973 to 1975 period. In the 1976-80 period, the annual growth rate is expected to be over 11% with total sales amounting to over \$558 million by 1980. This decrease in annual growth rate reflects the completion of the large expenditures made in the early 1970's for installation of the planned national telecommunications network. However, it does not include expenditures that may occur for the planned new domestic satellite system. Nearly one-half of Iran's communications equipment needs in 1980 are expected to be supplied by domestic manufacturing companies.

**Table 4.—Iran: Size of the Market for Communications Equipment**  
(in thousands of U.S. Dollars)

	1973	1974	1975	(Estimated)	
				1976	1980
<b>ELECTRONIC TELECOMMUNICATIONS EQUIPMENT AND MICROWAVE EQUIPMENT</b>					
Domestic Production.	320	705	300	7,200	15,300
Imports					
United States .....	14,042	14,705	36,024	28,992	31,700
West Germany ....	5,972	8,439	6,826		
United Kingdom ..	5,692	14,497	15,708		
France .....	1,985	6,896	14,578		
Japan .....	1,717	7,094	11,985		
Others .....	37,718	24,554	30,036		
Total .....	67,126	76,185	115,157	103,640	114,400
Exports .....	0	0	200	310	700
Market Size .....	67,446	76,890	115,257	110,530	129,000
<b>LAND LINE COMMUNICATIONS EQUIPMENT</b>					
Domestic Production.	18,300	23,100	30,150	34,900	52,500

**Table 4.—Iran: Size of the Market for Communications Equipment—Continued**  
(in thousands of U.S. Dollars)

	1973	1974	1975	(Estimated)	
				1976	1980
<b>CONSUMER HI-FI, RADIO, RECORDERS, TELEVISION EQUIPMENT</b>					
Imports					
United States .....	65	1,068	13,181	15,817	24,200
West Germany ....	5,428	11,217	18,518		
Japan .....	2,954	2,633	14,565		
France .....	986	826	1,244		
United Kingdom ..	957	794	710		
Others .....	6,090	6,787	11,649		
Total .....	16,480	23,325	59,867	65,850	71,300
Exports .....	658	660	58	240	3,600
Market Size .....	34,122	45,765	89,959	100,510	120,200
<b>ELECTRONIC PRODUCTION AND TEST EQUIPMENT</b>					
Domestic Production.	46,424	56,730	70,218	87,291	183,500
Imports					
United States .....	1,556	2,433	2,511	2,850	5,000
West Germany ....	1,916	2,091	4,352		
Japan .....	1,658	1,223	1,682		
United Kingdom ..	437	2,888	257		
France .....	334	555	585		
Others .....	1,884	3,937	3,442		
Total .....	7,785	13,127	12,829	11,320	26,600
Exports .....	22	145	39	110	2,600
Market Size .....	54,187	69,712	83,008	98,501	207,500
<b>ELECTRONIC COMPONENTS</b>					
Domestic Production.	35	242	475	670	1,500
Imports					
United States .....	3,810	5,151	9,012	11,196	24,300
United Kingdom ..	897	2,955	10,093		
West Germany ....	2,764	2,606	5,738		
Japan .....	204	328	1,843		
All Others .....	3,711	3,424	6,631		
Total .....	11,386	14,464	33,367	41,516	72,300
Exports .....	0	0	0	0	0
Market Size .....	11,421	14,706	33,842	42,186	73,800
<b>TOTAL COMMUNICATIONS EQUIPMENT MARKET</b>					
Domestic Production.	65,079	80,777	101,143	130,061	252,800
Imports					
United States .....	20,009	23,696	61,812	60,197	88,100
United Kingdom ..	8,301	21,560	27,323		
West Germany ....	21,322	29,171	40,657		
Japan .....	9,054	16,153	33,752		
All Others .....	54,919	49,173	70,137		
Total .....	113,605	139,753	233,681	236,356	312,900
Exports .....	680	805	297	660	6,900
Market Size .....	178,004	219,725	334,527	365,757	558,800

Source: United Nations, Organization for Economic Cooperation and Development, supplier country and official Iranian trade statistics; estimates based on trade interviews.

## Imports

United States communications equipment suppliers led those from all other countries in 1975 with sales of \$62 million, representing nearly 27% of total imports.

Major sales of telephone and microwave equipment were made by U.S. suppliers also accounted for over one-fourth by value of electronics production and test equipment imports in 1975, most of which were sold to military and police agencies. The market share of U.S. suppliers is expected to remain relatively stable through 1980.

West German suppliers sold \$40 million worth of communications equipment in Iran during 1975. A large portion of West German exports was used to expand a telephone assembly plant in Shiraz, which is partially owned by Siemens AG. of West Germany. Almost 45% of West German sales were of PABX systems used in the Iranian telephone industry. German suppliers have a large market share of both PBX and PABX equipment sales.

Japanese firms accounted for 14% of all imports of communications and electronic equipment in 1975. Telephone cable equipment and microwave equipment and systems made up two-thirds of all Japanese supplier sales.

## Domestic Manufacturing

In 1976 there were 20 manufactures of communications equipment in Iran. Five are telephone and telecommunications cable producers: Iran Bakya, which produces 8,000 tons of low voltage cables per year; Firouzaneh Company, which produces 500 tons of telephone cables annually; IKO Manufacturing Company, which is a Swedish joint venture; Simco, a producer of telephone cable; and the Cable Distribution Company which manufactures 800-1000 V. electrical cable. In 1975, domestic production supplied about 35-40% of the total Iranian communications equipment market.

There are also several manufacturers of telephone equipment in Iran. One is the Iran Telephone Manufacturing Company, which produces both rotary dial and push-button key-pad telephones. Another is Tabiran Company, a wholly-owned Iranian company which has a technical agreement with GTE of the United States. The firm manufactures both rotary dialing and push-button key-paid telephones and produced an estimated 500,000 sets in 1975. Iran Telecommunications Company, located in Shiraz, is a Government joint venture producing desk telephone sets. It is owned by the Ministry of War and Siemens of West Germany (30%). Telecommunications Company of Iran produced over 45,000 central office exchanges and over 200,000 telephone handsets. Most handsets made in Iran

were manufactured totally from imported German components. The Shiraz-based Iran-Nippon Company, a joint venture between NEC of Japan and Iranian interests, began producing low-voltage microwave components in 1975.

The Iran Electronics Industry (IEI), a Government-owned company, assembles General Electric, Westinghouse, and Hughes communications equipment under license. Mobile radios, air traffic control equipment, missile control equipment for the military, and security equipment such as electronic fences are produced. In 1976, IEI sold all of its output to the military. However, over the next several years more and more communications and electronic equipment will be produced for non-military users. Most equipment comes in key form, and the IEI trademark is attached after assembly. In the future, IEI intends to use its newly formed R&D Department to develop new products for communications users in the country. The company employs 2,000 people, and has an assembly plant in Shiraz, as well as offices in Tehran. IEI has established a joint venture with Control Data Corporation of the United States to assemble computer terminals (see chapter on Government, Business and Financial Establishments).

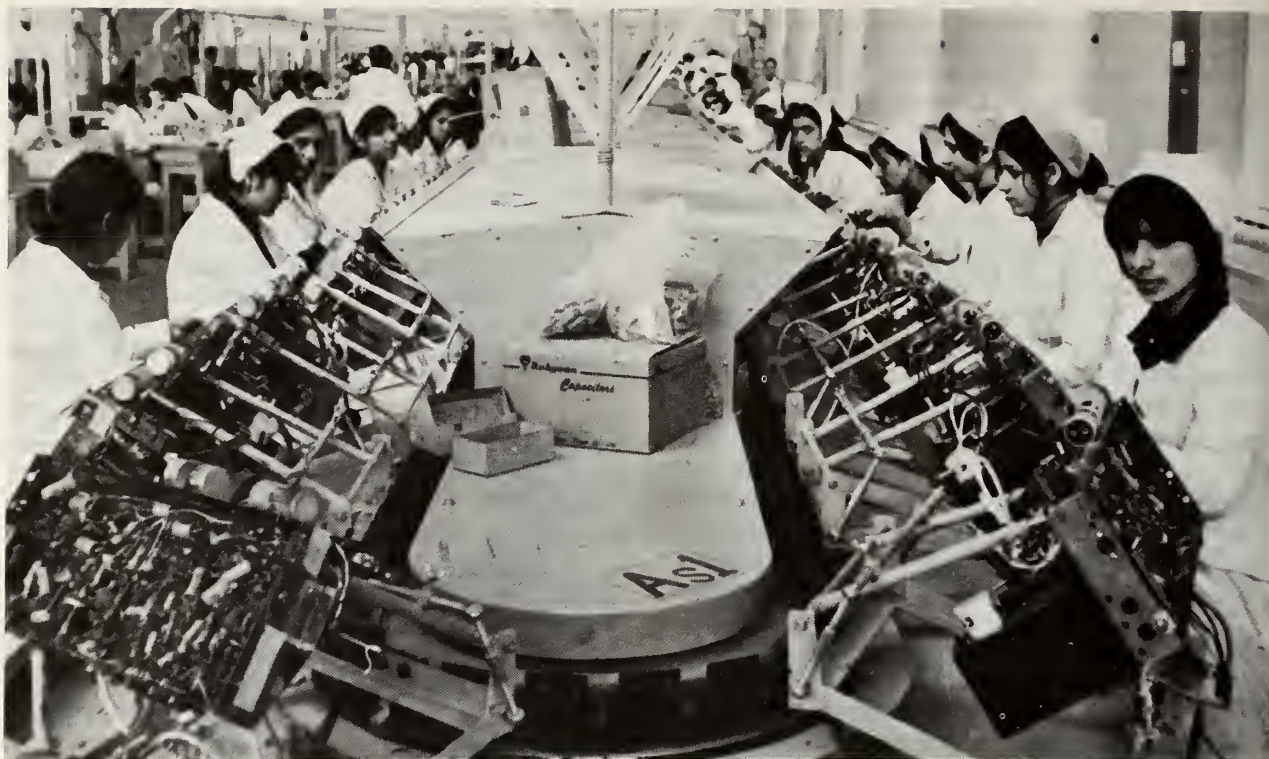
There are 10 Iranian producers of television sets, whose total output was over 350,000 units in 1975 (see table 5). Most Iranian production is by assembly and all firms have technical agreements with European or Japanese manufacturers. The largest television manufacturer is the Pars Electric Manufacturing Co., subsidiary of Tehran Electric Company, which produced almost 60,000 television sets in 1975. In addition to the television set producers, there is one components manufacturer, Transpic Company, which produces 200,000 picture tubes per year.

*Table 5.—Iran: TV and Radio Manufacturers, 1976*

	Production Capacity (units)
<b>Television Manufacturers</b>	
Pars Electric Mfg. Co. ....	170,000
Azmayesh Mfg. Co. ....	60,000
Bermo Electronic Industries Co. ....	2,000
Iran Radio & TV Co. ....	40,000
Kashani-Akhavan & Partners Mfg. Co. ....	10,000
Koufard Electronic Industries Co. ....	41,000
Mahboubi-Badiollah Co. ....	3,000
Mofid Mfg. Co. ....	60,000
Radio-Electric Iran Co. ....	60,000
Radio-Shanar Co. ....	45,000
	497,000
<b>Radio Manufacturers</b>	
Mahboubi-Badiollah Co. ....	3,000
Iran National Company ....	10,000
<b>Picture Tubes for TV</b>	
Transpic Company ....	200,000

Source: Trade interviews.





*Domestic television production provided over 350,000 sets in 1975.*

Mahboubi-Badiollah Company and Iran National Company, both of whom assemble radios under license from Japanese manufacturers, are the only domestic radio producers. Their production is low, since most radios in the country are purchased inexpensively from Japanese and other manufacturers in the Far East.

## MARKET OPPORTUNITIES

The following are the main types of communications equipment which will be required in Iran in the late 1970's and early 1980's.

**Post Office Equipment.**—Both automatic and semi-automatic sorting equipment will be needed in eight major post offices during the late 1970s. Optical character readers will be used for this purpose. There should also be a good market for weighing equipment and a small market for automatic mail sorting equipment.

**Telephone Equipment.**—A large amount of wire and cable for telephone lines will be imported at least through 1985, since domestically manufactured telephone cable cannot supply existing demand. Parts and components used in the manufacturing of telephones and PABX systems will also be in high demand. In addition, there is expected to be

large sales of subscriber equipment, resulting from the significant increase in the number of available lines and improved service during the mid-1970's. Items in strong demand are expected to be fully assembled PABX systems, trunk-connected intercoms, telecommunications terminals, telephone answering equipment, automatic dialing equipment, recording devices, centralized dictation systems, and decorator phones. There is expected to be only limited sales of data communications equipment and facsimile transmission devices through the late 1970s.

**Radio and Television Equipment.**—Considerable quantities of transmission, relay and associated equipment will be required for the expansion of Iran's radio and television transmission network, and the planned satellite-based educational television system. TV, audio and transmission equipment used in studio broadcasting will also be purchased in large amounts. Imports of radios and television sets will be limited due to growth in domestic manufacturing, but electronic components, TV test equipment, and consumer products such as hi-fi audio and tape recording equipment will continue to be in good demand.

**Telecommunications.**—A large part of Iran's telecommunications equipment imports have been supplied by a small group of foreign companies, many of which have contracts to supply the necessary



spare parts and test equipment. Future expansion of the telecommunications system is expected to be related to the planned domestic satellite system. The national microwave system will also require additional equipment such as wave guides, directional couplers, and attenuators to handle satellite communications.

**Non-broadcast Two-way Radio Equipment.**—There is expected to be only a limited market for non-broadcast equipment such as mobile and stationary radio and paging systems. Most sales will be to military and government organizations.

**Consulting and Technical Services.**—The Iranian communications system will continue to have considerable need for consulting and engineering services and technology. The Iranian electronics industry manufactures a large amount of communications equipment and components under licenses from foreign manufacturers, chiefly from the United States, Japan and Europe. Firms specializing in supply of mechanized postal equipment, satellite systems, and training systems will find a growing market, however.

## MARKETING ENVIRONMENT

### Buyers Universe

There are seven major government buying organizations that dominate the market for telecommunications equipment and systems in Iran. They are:

Name of Organization	Address of Purchasing Office
Ministry of PTT .....	Central Telephone Office, Sepah Square, Tehran, Iran
Telecommunications Company of Iran .....	Kourosch-Kabir Avenue, Bisim Pahlavi, Tehran, Iran
National Iranian Radio & Television Organization ..	Jam-Jam Avenue, Tehran, Iran
Iran Electronics Industry ..	Saltanatabad Avenue, Nimruz Square, Aghdasieh Street, Tehran, Iran
<b>Military Organizations</b>	
Air Force .....	Farahabad Avenue, Jaleh, Central Procurement Office, Tehran, Iran
Army .....	Saltanatabad Avenue at Dowlat Street, Tehran, Iran
Navy .....	Fischerabad Avenue, Tehran, Iran

The Telecommunications Co. of Iran (TCI) plans and implements all the systems in the country outside of the National Iranian Oil Company (NIOC) and National Iranian Gas Company (NIGC) sys-

tems. TCI normally calls for international tenders for any expansion in the telecommunications system, and for spare parts and equipment to be used in its maintenance and repair.

The Ministry of PTT issues tenders for projects, spare parts and systems. A committee within the PTT makes purchasing decisions based on recommendations from the directors general heading the Ministry's various operating divisions.

The military establishment, which includes the Ministry of War, the Imperial Iranian Navy and the Imperial Iranian Air Force, must also issue tenders for all equipment purchases. Decisions about quantity and type of equipment to be purchased are made by central procurement committees in each arm of the military, based on recommendations given by those who are directly concerned with the particular project. The purchase of a large amount of U.S. communications equipment for the Iranian Military is handled as "Foreign Military Sales" cases supervised by the U.S. Department of Defense. Most of the sophisticated electronic communications equipment for aircraft, radar and testing is sold with all maintenance and spare parts included. The U.S. Military Assistance Group in Iran cannot recommend individual companies for equipment, but can be helpful in explaining new Iranian military programs which require communications equipment. The Iranian military purchases only directly from equipment manufacturers and not through export companies or sales representatives.

The NIOC and NIGC issue tenders for purchases of all communications equipment. Procurement of communication systems by the Government or by government companies such as the NIOC and NIGC must have authorization from the Ministry of Information. All of these buying groups depend heavily on the help of foreign companies to prepare tender notices and for other assistance. This includes technical and management contracts and also contracts for maintenance and training.

Consultants normally play a key role in the sales of most communications systems in Iran. The contract for expansion of the telephone system in Iran was awarded to GTE of the United States, which is not only helping to plan the system, but will construct the necessary facilities. RCA is not only a major supplier of telex communication equipment, but is also a technical consultant to the Ministry of PTT. American Telephone and Telegraph Co. (U.S.) has been awarded a contract to determine Iran's communications needs (both civilian and military) for the next 20 years. This master plan will be done by AT&T's newly formed international consulting company, American Bell International (ABI). The armed forces rely heavily on the advice of military assistance missions and technical con-



sultants in making purchase decisions for military communications equipment.

## Foreign Suppliers Universe

Consortia are normally formed for the implementation of large telecommunications projects and in the mid-1970's two very large consortia were put together for this purpose. In the GNPS consortium which installed the Integrated National Telecommunications System, Page Communications Engineers were implementors of the project; GTE supplied most of the microwave equipment; and Siemens of West Germany supplied most of the power equipment needed in the network. GTE and Siemens continue to provide spare parts and other test equipment for this system. A Franco-German-Japanese consortium received the contract for the open wire carrier project which was implemented in the early 1970's.

There are approximately 20 firms which supply telephone and PBX systems in Iran. These companies include Siemens of West Germany and ITT of the United States, each accounting for approximately 20% of the market, followed by a large number of other companies including Philips of the Netherlands, NEC of Japan, Northern Electric Company Ltd. of Canada, Motoronic and Oki Electric Industry Co. Ltd. of Japan, A.O.I.P. S.A. of France, L.M. Ericson of Sweden, and Pye division of Philips Electronic and Associated Industries Ltd. (U.K.) which sells automatic telephone dialing systems. There are only two leading suppliers of two-way non-broadcast radio equipment currently selling in Iran, Motorola Inc. (U.S.) and General Electric Company (U.S.). Other firms such as Collins Radio Co., subsidiary of Rockwell International (U.S.), have made only limited sales.

There are six leading suppliers of television and radio broadcasting equipment to Iran, and a large number of smaller companies who sell periodically to the NIRT in Tehran. Leading firms include Sony Corporation of Japan and Ampex Corporation of the United States, which are the chief suppliers of video tape equipment and television broadcasting equipment. The NIRT has standardized its use of equipment to those supplied by these two companies. Other equipment suppliers who have been selling regularly in Iran are Charles Beseler Company and Wollensak, a division of 3M Company both of the United States (projection equipment); Akai Electric Co. Ltd., and Sony of Japan (recording equipment), 3M Company (overhead projection systems), Bousch-Fresi of West Germany (cameras), RCA Corp. (U.S.) (recording equipment), Dukane Corp. (U.S.) (projectors), Eastman Kodak Company of the United States (35 mm slide projectors), Bauer

Company of the United States (16 mm projectors) and Schumbeger Company of France (audio equipment).

Telex equipment and receiving sets are sold by Siemens AG of West Germany and RCA and the Telex Corporation of the United States. Telex Corp. sold approximately 60% of the telex equipment market in 1975. This was primarily the result of a well planned marketing program and efficient customer assistance.

## Marketing Factors

A number of multinational companies selling communications equipment in Iran rely on branch offices for their sales development efforts. Companies with branch offices in Iran include General Electric Company, Westinghouse Electric Corp., General Telephone & Electronics Corp. (GTE), (all of the United States) and Siemens AG of West Germany. Other firms rely on Iranian representatives to sell their products. Military equipment is normally sold by U.S. suppliers under the "Foreign Military Sales" program. A limited number of other foreign suppliers sell directly to the Iranian military establishment.

Sales of communications systems for major projects and spare parts for existing systems are generally made through long-term contracts. In most cases the prime contractor subcontracts for equipment and parts needs.

Since sales of communications equipment and parts for major projects normally are made through international tender with supplier companies agreeing to supply spare parts to the customer for a specific number of years, this often effectively forecloses penetration of the market to other suppliers. Several companies have established strong market positions through contracts with government agencies for the local assembly and supply of equipment. This is the case for Motorola Inc., General Electric, Westinghouse and Hughes Aircraft Co., all of which have signed licensing agreements for local assembly of communications equipment with government or quasi-government agencies.

Quality and compatibility of equipment are the main purchasing criteria for the Iranian Government telecommunications agencies. Most communications systems sold to other Iranian users are purchased on the basis of price and delivery factors. A large number of Iranian buyers are not familiar with specialized communications equipment, and rely on sales representatives to acquaint them with the technical aspects of equipment needs. Long-term supplier relationships thus play a key role in many sales. The principal means of market promotion is through sales calls. There are no specialized Iranian telecommunications trade journals.

Consumer electronics products such as radios, television sets, tape recorders, etc. are sold through a system of major distributors throughout the country. Both domestic manufacturers and suppliers of imported products depend heavily on advertising to build consumer preference. Price competition is very strong among consumer equipment suppliers, and both advertising and brand preference play a large role in sales of consumer electronics products.

The Government of Iran does not enforce a system of international standards in sales of most communications equipment. In sales of consumer electronics equipment, however, Consultative Committee for Radio (CCIR) standards prevail and all equipment uses 230 volt, 50 cycle power.

### **COMPETITIVE POSITION OF U.S. SUPPLIERS**

There are 25 to 30 U.S. companies which are regularly marketing communications equipment in Iran. General Telephone & Electronics Company sells some telephone equipment through its Romanian subsidiary, and Hewlett-Packard sells some test equipment from its European headquarters in Switzerland, but most other major American suppliers sell directly from manufacturing plants located in the United States.

U.S. suppliers' recognized technological leadership in development of microwave systems, electronic

telephone exchanges, and sophisticated satellite communications networks is an important marketing advantage in Iran. Another advantage for U.S. suppliers is their proven ability to make rapid deliveries of large communications equipment orders to major customers such as the Iranian Armed Forces. Because of the well established presence of U.S. suppliers, and because many communications systems in Iran are now using U.S. equipment, it is expected that U.S. firms will dominate sales in these market segments at least through the 1976-86 period.

The Iranian Government decision to use the French "Secam" TV color system and domestic manufacture of radios television sets under licenses from Japanese and German suppliers puts such U.S. consumer electronics equipment at a distinct disadvantage for sales in Iran.

The entry of new supplier firms into some segments of the Iranian communications equipment market will be difficult in future years because a somewhat complex system of well-established traditional suppliers has been built up. Competition resulting from various long-term contracts for major communications projects and the expansion of domestic manufacturing will also make entry of new supplier firms more difficult. In order to compete effectively for sales in the growing communications equipment market, U.S. firms will have to place greater emphasis on strong representation, delivery factors, supplier credit, and after sales service.



# Construction and Public Works

CONSTRUCTION ACTIVITY in Iran grew sharply during 1973-75, spurred by massive government-sponsored infrastructure projects and an increase in new housing starts. Investment in construction, both government and private, rose in value from \$1.4 billion in 1970 to over \$9 billion in 1975 (see table 1). Construction contributed an estimated 16% to gross national product (GNP) in 1976. Value of new construction put in place was \$2.8 billion in 1973, and reached an estimated \$4.6 billion in 1976 (see table 2). Urban housing starts increased from 62,000 units in 1970 to over 90,000 by 1975, when over 11 million square meters of floor space was constructed in the major cities of Iran.

The growth in the number of high rise buildings, commercial and industrial complexes constructed, coupled with shortages of skilled workers and the increasing cost of labor, has led to investment by the construction industry in new equipment, materials, and technology which speed up construction time and cut labor costs. Investment in new equipment by the industry grew from \$157 million in 1970 to an estimated \$638 million in 1976, and is projected to reach about \$1 billion in 1980.

## STRUCTURE AND SIZE

The construction industry includes a large number of architectural, engineering, contracting, and

building firms which range in size from small, family-owned businesses to large companies employing 1,000 or more people (see tables 3 and 4).

The Iranian Government's central planning office, The Plan and Budget Organization (PBO) annually issues an approved, graded list of firms, which is used to select contractors on all large, government-sponsored construction projects. Firms that have failed to complete projects on time, or have done work that is not up to the standards of the building authorities, are either taken off the list or downgraded. The main criteria used in rating approved firms are the capital of the company and the number of engineers and specialized personnel employed. Firms are categorized from grades 1 through 15. The particular grade assigned to a firm determines the value and type of construction contract that can be awarded.

In 1975 over 170 design engineering and architectural firms were on the approved list. In addition, a separate list exists for building contractors, which now contains over 600 building contractors meeting the criteria set out by PBO. Additionally an estimated 300 small firms which are not officially approved by the PBO work only on private residential construction.

An example of one of the larger contracting firms in Tehran is Precision Co., which was founded in 1945. This firm has over 5,000 employees, and specializes in construction of residential and commercial

*Table 1.—Iran: Construction and Public Works Development Indicators*

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
Capital Expenditures (current prices)						
Government (millions U.S. \$) .....	894.9	2,071.8	3,601.1	6,480.9	8,424.0	15,500
Private (millions U.S. \$) .....	492.4	1,097.7	1,444.1	2,574.5	3,475.0	8,000
Total .....	1,387.3	3,169.5	5,045.2	9,055.4	11,899.0	23,500
Number of New Construction Permits Issued						
Tehran .....	NA	8,541	14,763	10,803	12,000	20,000
Other Cities .....	NA	9,595	18,499	17,414	19,000	29,000
Total Floor Space (thousands sq. met.) .....	NA	4,206	12,158	11,365	15,000	21,000
Average Floor Space (thousands sq. met.) .....	NA	231.9	365.5	402.8	440.0	420.0
Value Added By Construction Activities (millions US \$) ...	592.4	1,120.4	1,936.9	3,926.3	5,300	12,000
Private Urban Housing and Starts (units) .....	62,900	71,600	86,100	90,300	110,000	150,000
Private Urban Housing Completions (units) .....	60,000	67,300	71,800	85,100	97,000	140,000
Average cost of Home Construction (US \$1 sq met) .....	42	63	70	101	135	236

<sup>1</sup> Estimates.

Source: Bank Markazi Iran.

**Table 2.—Iran: Value of New Construction Put in Place**  
(in millions of U.S. dollars)

	1972	1973	1974	1976 <sup>1</sup>	1980 <sup>1</sup>
Private construction					
Residential buildings					
Single-family dwellings .....	109	214	183	264	1,200
Multi-family dwellings .....	89	124	181	323	800
Nonresidential buildings					
Commercial .....	176	235	242	332	850
Industrial .....	46	61	63	87	200
Religious .....	8	10	11	15	50
Hospitals and institutional ..	10	14	14	20	50
Farm (other than residential) ..	52	104	130	149	300
Other .....	29	39	41	56	150
Public construction					
Residential buildings					
Single-family dwellings .....	21	41	55	96	350
Multi-family dwellings .....	14	23	32	128	150
Nonresidential buildings					
Industrial .....	26	45	120	97	250
Educational .....	4	3	4	5	100
Hospital .....	138	169	136	218	350
Other .....	57	118	84	76	300
Highways, roads, and streets ..	183	281	303	437	1,050
Military facilities .....	104	161	173	249	600
Conservation and development of natural resources .....	248	382	412	593	1,400
Sewer systems .....	—	—	—	249	450
Water supply facilities .....	50	73	52	42	50
Other <sup>2</sup> .....	510	785	845	1,218	3,000
Total public and private construction .....	1,874	2,882	3,081	4,654	11,650

<sup>1</sup> Estimates.

<sup>2</sup> Public airports, transportation terminals, warehouses, powerplants, public utilities.

Source: Bank Markazi Iran.

buildings, as well as public works projects. Precision's equipment includes 20-ton Mack trucks (domestically assembled by Khavar Company under license), 32 bulldozers and loaders from Komatsu Ltd. of Japan, and 20 25-ton stone carriers from Kocums AB. of Sweden. The firm's contracts for government projects totaled about \$135 million in 1975.

The Civil Company, founded in 1964, is another large contractor located in Tehran. In 1975 the firm employed 1,000 full-time personnel and over 3,000 laborers on short-term contracts. As of early 1977, the company was engaged in residential building, as well as construction of roads and railway facilities. The firm's road-building equipment purchases in 1975 included four bulldozers from Komatsu Ltd. (Japan) and two bulldozers from Fiat-Allis B.V. (Netherlands), an affiliate of AllisChalmers Corp. (U.S.), as well as seven Fiat-Allis loaders and two Jeffrey-Galion Inc. (U.S.) graders. Additionally, the firm has purchased eight new asphalt vibrators from various supplier firms.

A number of international construction and engineering firms are active in Iran. Approximately 40 U.S. firms are either affiliated with or have equity positions in Iranian engineering or construction organizations. Among the leading foreign firms engaged in design and engineering in Iran are Blount Bros.

**Table 3.—Iran: Leading Architect, Engineering Design and Consulting Firms**

Firm	Fields of Specialization
A. Farmanfarmaian & Partner Ave. Kakh #118 Tehran, Iran	Commercial and government bldgs., housing construction, educational and health bldgs., town planning.
Architect Cooperative Bureau Ave Kheradmand #87 Tehran, Iran	Commercial and government bldgs., housing construction, educational and health bldgs.
Artiman Company Ave. Kakh, #141 Tehran, Iran	Commercial and government bldgs., housing construction, educational and health bldgs.
Bourboor Company Darouss, Shahrezad Blvd. Tehran, Iran	Commercial and government bldgs., housing construction, educational and health bldgs.
Bourna Consulting Company Ave. Takhte-Jamshid #285 Tehran, Iran	Town utilities, water supply, distribution and filtration of water, collection and disposal of sewage and garbage, and drainage.
Consulting Engineers Consortium Company Ave. Saba, Azar St., #18 Tehran, Iran	Government bldgs., commercial, educational and health bldgs., road construction including main and feeder roads, railway bridges and tunnels.
Dr. Ali Adibi Company Ave. Shah Aluminum Bldg., 9th Fl. Tehran, Iran	Town utilities, town planning, road construction, airport, jetties and port facilities, marine structures, water resources, irrigation systems, flood control.
Hounar Company Ave. Rasht, #44 Tehran, Iran	Town utilities, road construction, airports including terminal complexes, runways and air traffic control facilities, water resources, irrigation systems, flood control.
Iran-Kampsax Company Ave. 25th Shahrivar Ave. Pakistan, 2nd St. #74 Tehran, Iran	Road construction, jetties and port facilities.
John A. Bloom & Partners Ave. Takhte-Jamshid #365 Tehran, Iran	Commercial and government bldgs., housing construction, educational and health bldgs.
Monenko-Iran Company Ave. Farah Kayhan Sharghi St., #5 Tehran, Iran	Generation of thermal power, transmission-distribution of electric power.
Pars Consult Company Ave. Aban #24 Tehran, Iran	Road construction, airport facilities.
Payah Consulting Company Ave. Iranshahr, #182 Tehran, Iran	Water resources (surface and underground), irrigation systems, flood control.
Quanta Consulting Company Blvd. Elizabeth II, #165 Tehran, Iran	Town utilities and water systems, generation of thermal power, transmission and distribution of electricity.
Ramp Consulting Company Ave. 25th Shahrivar, #233 Tehran, Iran	Road construction including main and feeder roads, railway bridges and tunnels, airports including terminal complexes, runways and air traffic control facilities.
Taleghani-DAftari Company Ave. Sepahbod Zahedi Khosbin St., #42 Tehran, Iran	Town utilities and water supply, road construction, irrigation systems, forest preservation, water resources, flood control.
Tarh Va Pajouhesh Company Ave. Abbasabad, #3 Tehran, Iran	Urban planning.
Tosseh-Omran Company Ave. Shahreza #45 Tehran, Iran	Commercial and government bldgs., housing construction, educational and health buildings, town planning.
Yekom Consultants Company Ave. Saba Shomaki, #77 Tehran, Iran	Water resources (surface and underground water), irrigation systems, flood control dikes and small dikes

Source: Trade interviews.



**Table 4.—Iran: Leading Contracting Firms**

Contractor	Value of Work Underway in 1976 (millions of US \$)
Mahak Company .....	464.3
Jolgeh Company .....	419.7
Precision Company .....	135.6
Asab Ekbatan Company .....	112.0
General Mechanic Company .....	104.1
Priouz Company .....	101.1
Zamineh Company .....	93.7
Landa Company .....	89.4
Dey Company .....	76.7
Mojm Company .....	72.4
Payniz Company .....	70.2
Consersium Shargh .....	71.0
Ark Company .....	68.8
Nokar Company .....	66.7
Hadish Company .....	59.6
Rasheh Company .....	58.2
Perjam Company .....	55.1
Tajan Company .....	53.9
Sakhtemani Kara Company .....	52.5
Malavi Company .....	52.3
Ira Company .....	52.1
Lozan Company .....	51.1
Polsang-Sanandaj Company .....	49.6
Melli Sakhteman Company .....	48.8
Panket Company .....	47.8
Iran Sabeta Company .....	46.8
Sangin Company .....	46.8
Ros Company .....	44.2
Construction Company .....	44.0
Mika Company .....	44.0
Niknam Company .....	43.1
Chakosh Company .....	36.0

Source: Trade interviews.

Int'l., Kaiser Engineers Int'l. Inc., Stone and Webster Construction Ltd. (U.S.), Hyundai Construction Co. Ltd. (South Korea), Saipem S.p.A. (Italy) and Transmark (U.K.). Other active foreign construction and engineering companies are identified in each of the chapters of this book.

Engineering and architectural firms are becoming increasingly important as the construction industry grows. Profiles of representative firms follow.

Pars Consulting Co., one of the largest engineering companies in Iran, began operations in 1960 with road construction work. By 1975, the company had 300 employees (including 60 engineers and 70 draftsmen), and was engaged in design work on 970 kilometers of roadways, including the Damavand-Firuzkuh-Zirab road, the Mashhad-Ghaen-Birjand road, the Sanandaj-Hamadan road and the Zanjan-Bijar-Davenandari road.

Architects Co-operative Bureau is an Iranian firm with a staff of 25, most of whom are engineers and draftsmen. The firm, founded in 1960, does design work for housing and office buildings and undertakes city planning projects. In 1975 the firm was engaged in city planning projects for Mashhad, Bojnurd, Nishabur, Sabzevar, and Torbat Heydarieh, all in Khorasan Province.

John Bloom & Partner Consulting Co., which operates as a branch office of Bloom Engineering Co., (U.S.), designs commercial and government buildings, as well as hospitals, educational centers, and housing complexes. In 1975 the firm employed 7 engineers, 15 draftsmen and 3 architects among its professional staff. In 1976 the firm was designing two logistics centers to be located in Qazvin and Esfahan for the Imperial Iranian Armed Forces; it also was working on the preliminary design of a nuclear power plant for the Iranian Atomic Energy Organization.

**Construction Methods and Materials.**—Urban buildings and private homes are built primarily using steel beam construction, with brick flooring and walls, and stone facing. Only in the larger cities are buildings of more than one story constructed. Much urban construction is built with common walls, although there is some detached residential construction in suburban areas. A number of new buildings are being built of precast concrete and preengineered structural steel components. The use of this type of construction is expected to gain momentum. Highrise buildings (10 stories or more), of which fewer than 3,000 were built in 1975, will become commonplace by the end of the decade. Some large construction companies are beginning to use precast flooring and walls, and some modular houses are being introduced in Tehran.

Despite extremes in temperature, insulating materials are not used extensively in commercial and residential construction. Their use in 1975 was limited primarily to modern high-rise buildings. Wood is used primarily for interior furnishings and doors, and to a very limited extent in window frames; it is not used as a primary building material. Most urban buildings use metal window and door frames, as well as custom-fabricated metal gates, fencing, grillwork, and other decorative metalwork.

Use of aluminum and glass is increasing in commercial buildings. Tile is the standard flooring, although wooden flooring is being used increasingly in high cost residential construction. Suspended ceilings and gypsumboard partitions are finding growing use in industrial and institutional construction. Paper and fabric wall coverings (both ornate and plain) as well as paint are popular for interiors. Roofing felt is replacing tar and sand as a sealant on Iran's traditionally flat-roofed urban buildings. Plumbing fixtures and sanitary ware in use varies from relatively crude tin and precast stone to porcelain. Such fixtures are generally bought piecemeal, and use of modular kitchen and bathroom units had not been established in the industry as of early 1977.



*Reinforced concrete high rise buildings are replacing traditional brick and beam construction in Tehran and other large cities.*

### **Principal Government Offices**

The Plan and Budget Organization (PBO) located at Meidan Baharestan Square in Tehran, assembles statistics relating to the activities of Iran's construction industry. Its main function is to control government budgets for each fiscal year, much in the manner of the Office of Management and Budget in the United States. The PBO also approves contractors for participation in government projects.

The Ministry of Energy is the main government agency concerned with the building of power plants and dams. The Ministry of Roads and Transport has overall responsibility for construction of roads and port facilities. Most major government industrial organizations are engaged in construction activities. The National Iranian Oil Company constructs oil field production facilities, storage facilities and refineries. The Government's investment and holding company, the Industrial Development and Renovation Organization, constructs industrial parks and other industrial facilities, and also operates several

housing and prefabricated building materials manufacturing companies.

The Ministry of Housing and Urban Planning (Sepah Ave., Varzesh Square, Tehran) is responsible for programs and projects related to urban planning, land use, urban water supply and sanitation, new town development and housing. The Housing Organization, located in Tehran on Mofkadam Avenue at the Lalezar-Shahreza crossroad, builds housing units for various government entities. The Building and Housing Research Center, located on Old Rarabad Road off the Tarasht Highway in Tehran, is the major construction research center in Iran. This organization, which began operations in 1973, studies and publishes data on architectural design and engineering, and tests building materials to promote the improved quality of construction. The Center also works as a consultant to the private sector and the Government on problems relating to construction and building projects.

The Tehran Municipality (Iranshahr Ave, Tehran) has separate offices responsible for urban de-



velopment and urban renewal projects, new town construction, construction of the Tehran subway, road construction and maintenance, building code enforcement, and construction permits. Building codes and technical standards for construction are issued by the Housing Research Center, the Housing Organization and the Tehran Municipality. An inter-ministerial High Council on Town Planning also issues regulations on land use and construction.

Several specialized government banks are engaged in financing construction, and in some cases contract directly for construction. Bank Rahni (The Mortgage Bank), Ferdowsi Avenue, Tehran, is a government bank engaged in financing a 25-year urban housing program. Bank Rahni also has constructed several housing complexes in various parts of the country. Bank Sakhteman (Construction Bank), located at 160 Elizabeth II Blvd., Tehran, began operations in 1973; it is engaged in building hotels and tourist facilities, urban reconstruction, creation of satellite towns, as well as housing and commercial construction. The bank also finances projects for the manufacture of building products. Through early 1977 the bank had financed three prefabricated housing plants, one brick factory, three factories for manufacturing partitions, and one factory producing standardized doors.

## **TRENDS, PROGRAMS AND PROJECTS**

Government spending has been the principal component of investment in construction during the 1970's. Government investment in construction grew at an average annual rate of 48% during 1970-75, while the Government's share of investment rose from 64%, or just under \$900 million in 1970, to 71%, or almost \$6.5 billion, by 1975. Construction activity was stimulated during 1973-75 by large development budgets financed by increased oil revenues. The Government is heavily engaged in infrastructure development; construction of housing, while receiving increased attention by government agencies, is still primarily in the hands of the private sector. The Government also made available large credits to state-owned and private banks which were used for the construction of private buildings and residences. Private investment in construction, while growing at an average annual rate of about 39% during 1970-75, declined as a percentage of total construction investment from 35% in 1970 to 28% in 1975. This was in part due to the high level of building activity by state-owned corporations, public housing projects, the construction of educational and health facilities, and infrastructure development.

The construction industry in Iran suffers from a shortage of skilled labor. These shortages are felt most keenly among electricians, plumbers, masons,

iron workers, and painters. The Ministry of Labor estimated in 1976 that over one million persons would have to be trained in construction skills in the 1976-86 decade if the construction industry is to meet Iran's needs for new building. Of the approximately 600,000 people engaged in construction activities in Iran during 1976, almost 80% were unskilled laborers paid on a daily basis. Massive investment will be required to develop the skills needed. Even if the Ministry of Labor focused all its training efforts on construction skills, only about 20,000 workers per year could be trained. As a result of the shortage of skilled labor, construction worker's wages rose at an average annual rate of about 35% during the early to mid-1970's. Because of labor cost increases, many construction firms began shifting to labor-saving construction methods and equipment.

Increasing personal income and growing urbanization in recent years have stimulated demand for new housing. The rapid pace of construction during the early 1970's led to shortages of building materials, soaring costs, and disruption of building schedules. These problems were compounded by the transportation bottlenecks which emerged in 1974 and became acute in 1975. The situation began to ease somewhat in 1976, as a result of improvements made in ports, increased domestic production of construction materials, and the inauguration of policies by the Government designed to reduce land speculation and stimulate private-sector building.

Iran's ambitious development programs have resulted in increased construction outside the capital area. To spur decentralization the Government prohibits the building of new industrial facilities within a 120 kilometer radius of Tehran. A number of new integrated industrial centers are being developed in provincial areas, such as the Alborz Industrial City near Qazvin northwest of Tehran, the Shah Reza Industrial Complex near Esfahan, and a similar development planned for Khorasan Province in the northeast.

Many new projects being developed to exploit Iran's rich natural resources are in remote areas, and require the construction of extensive supporting infrastructure. Thus, the construction component in an industrial project often considerably exceeds the construction component in similar industrial facilities in more developed countries. For example, the Sarcheshmeh copper mining project near Kerman has required the construction of a residential community, access roads, power generation, water supply, and sewage treatment plants, and other facilities needed to accommodate a work force of several thousand.

Total investment in construction is expected to grow at an average annual rate of about 21% during 1975-80, reaching about \$23.5 billion in 1980.

Government investment, projected at \$15.5 billion in 1980, is expected to remain the largest component. Value of new construction put in place in 1980 is expected to reach over \$11.5 billion, of which the public sector should account for some \$8 billion, or about 69%. Transportation, electric power, and other utilities and infrastructure are expected to represent the largest portion of new government construction, totaling about \$3 billion. Development and conservation of natural gas, petroleum and other natural resources is expected to account for construction totaling \$1.4 billion. The value of new public housing constructed is projected to reach about \$500 million. In the private sector, residential construction is expected to total about \$2 billion in 1980, with other types of private-sector construction totaling about \$1.5 billion. Public and private construction activities are summarized in the following discussion. Many projects identified are outlined in more detail in the appropriate chapter of this book.

## Government Construction

**Government Buildings.**—Government agencies normally have purchased existing buildings from private owners rather than build their own structures. New buildings funded by government organizations are built under contract by private firms. Examples of new buildings which have been specially constructed for government agencies include a post office building in South Tehran and the newly completed 16-story building for the Ministry of Agriculture on Elizabeth II Blvd.

Most construction of new government buildings is outside Tehran. As part of the effort to decentralize government activities, the Fifth National Development Plan (1973/74–1977/78) states that priority will be given to construction of government buildings in districts, small towns, and regional centers. The Government has been constructing an increasing number of centralized government office buildings in provincial areas, designed to house the administrative offices of several government organizations in one location. Decentralization has proven difficult to implement, and many ministries and government agencies have turned to renting accommodations to meet their increased requirements for office space within the capital.

Total expenditures for government buildings rose from \$446.5 million in 1973 to \$972 million in 1975 (see table 5). The highest level of expenditures was for construction of schools, universities, hospitals and clinics, and buildings constructed in connection with major government development programs.

**Medical Facilities.**—Under Iran's master health plan, 14 regional hospitals, averaging 600 beds each, were either under construction or in the design stage

**Table 5.—Iran: Direct Government Disbursements for Government Buildings, Housing and Urban Development**  
(millions of U.S. dollars)

Category of Construction	1973	1974	1975
<b>Government Buildings</b>			
Civil administration .....	18.0	34.5	31.9
Public order and security agencies ..	10.3	26.1	42.0
Other public buildings (educational and health facilities, and buildings for major government programs) ..	418.2	565.2	898.1
<b>Total .....</b>	<b>446.5</b>	<b>625.8</b>	<b>972.0</b>
<b>Housing</b>			
Worker housing .....	56.3	74.3	145.5
Government employee housing .....	121.9	282.9	479.5
Low-cost housing project .....	21.7	137.2	93.1
<b>Total .....</b>	<b>189.9</b>	<b>494.4</b>	<b>718.1</b>
<b>Urban Development</b>			
Urban expansion .....	1.8	1.7	8.8
Water supply .....	13.0	44.9	44.8
Sewage treatment facilities .....	3.1	8.4	16.7
Urban security facilities .....	5.8	7.6	9.9
Urban transport .....	11.2	19.4	41.7
<b>Total .....</b>	<b>34.9</b>	<b>82.0</b>	<b>121.9</b>
<b>Total Government Expenditures .....</b>	<b>671.3</b>	<b>1,202.2</b>	<b>1,812.0</b>

Source: Bank Markazi Bulletin.

in 1976. The total cost of these hospitals, being built for the Ministry of Health and Welfare, is estimated at \$500 million. The plan also calls for construction of 130 satellite hospitals in the 50- to 150-bed range to be built throughout the country. By the end of 1976, funds had been committed totaling \$131.2 million for the construction of 25 of these facilities. Funds for the construction of additional hospitals in this category are expected to be included in the Sixth National Development Plan (1978/79–1982/83) (see also Medical and Health Services chapter).

**Water Resource Development.**—Because much of Iran is arid or semi-arid, development and conservation of water resources is of considerable importance. The Fifth Plan allocated \$2.35 billion in capital expenditures for water resource development, including irrigation networks, urban water supply, hydroelectric power generation and flood control. Between 1958 and 1976, 14 major dams went into operation (see Table 6). The largest portion of capital expenditures, slightly over \$1 billion, was earmarked for construction of irrigation and delivery systems below these dams. Construction was to include completion of work initiated during the Fourth Plan on primary canals irrigating 387,000 hectares, and secondary canals covering an area of 140,000 ha. Additionally, new work was to be initiated to bring an additional 913,000 ha under irrigation, while secondary canals covering about 1.1 billion ha were to be started. (see also Agro-Industry chapter).

Major dam projects that were under construction or in final design stages in 1976 included: an arched concrete dam in the Jiroft area of Kerman province estimated to cost \$17.6 million; a concrete dam at





*Heavy equipment in use on irrigation canal excavation.*

Minab, near Bandar Abbas, with an estimated cost of \$32.3 million; an earth dam with hydro-electric facilities at Lar, northeast of Tehran, at an estimated cost of \$168 million; and an arched concrete dam near Saveh, southwest of Tehran, at an estimated cost of \$18.4 million. The Fifth Plan allocated \$790 million for completion of reservoir dams started

during the Fourth Plan, construction of new reservoir dams, wells for exploitation of groundwater, and diversion of water resources to areas without adequate supply. Projects actually approved and budgeted during the first 3 years of the plan period totaled \$251.3 million.

**Urban Development Projects.**—The Fifth Plan allocated \$390 million for urban development projects, including urban planning, water supply, sewage treatment, flood control and transport. Total expenditures for urban development rose from \$34.9 million in 1973 to \$121.9 million in 1975. Septic systems are the primary form of sewage disposal in Iran. Although the Fifth Plan gave priority for construction of new sewage treatment facilities in Tehran, at industrial centers, and in other cities having high water tables, the city of Tehran has no such system.

In 1975 water supply projects with a total investment of about \$1.4 million were being implemented, and sewage treatment facilities, representing a total cost of about \$5 million, were being constructed. A combined water supply and waste treatment project was also under way at the city of Arak with a total cost of \$624,000 (see table 7). A total of \$323 million was allocated for urban transport during the Fifth Plan; the major urban transport project initiated is the construction of the Tehran subway (see Transportation chapter).

**Housing Projects.**—Major investment in housing by the Government did not begin until the Fifth Plan. Before then the Government had relied on

**Table 6.—Iran: Specifications of Dams, 1975**

Name of Dam	Type of Dam	Location	Height from foundation (meters)	Capacity (million cubic meters)	Year Operation started	Cost of Dam Mil. Rials	Engineering Consultants
Shah Esmail .....	Earth	Akhtekhan	56.0	44	1958	280	Justin & Courtney
Amir Kabir .....	Arched concrete	N. of Karaj	180.0	205	1962	4,800	Harza Engineer. Co.
Shahbanu Farah .....	Buttressed concrete	Mangil	106.0	1,800	1962	4,500	Etko Ofer
Mahammad Reza Shah-e-Pahlavi .....	Arched concrete	Desful	203.0	3,340	1963	5,377	D & R
Shahnaz-e-Pahlavi .....	Buttressed concrete	Yalfan-e-Hamadan	65.0	8	1964	919	Verbundplan
Farahnaz-e-Pahlavi .....	Buttressed concrete	Latyan	107.0	95	1968	4,326	Alexander Gibbs Ltd.
Shah Abbas-e-Kabir .....	Arched concrete	W. of Esfahan	100.0	1,250	1971	3,000	Sogreah-Syferlac Co.
Voshmgir .....	Earth	Sangar Savar, Gorgan	21.0	79	1971	505	Etko
Aras .....	Earth	Aras	38.0	1,350	1971	3,588	Back/Gerdro Rogers
Shahpur-e-Avval .....	Rock fill	Mahabad	46.5	230	1971	940	Harz Engineer. Co.
Kurosh-e-Kabir .....	Earth	S.E. of Bukan	50.0	650	1971	1,266	Justin C & Taleghani-DAftari
Dariyush-e-Kabir .....	Earth	Dorudzan	60.0	993	1972	1,700	
Reza Shah-e-Kabir .....	Arched concrete	Masjed Soleyman	200.0	2,900	1975	8,800	Harza Engineer. Co.
Taleqan .....	Earth	Sangban	70.0	208	1976	1,900	Taleghani-DAftari
Nader Shah-e-Afshar .....	Rock fill	Tang-e-Takab	175.0	1,620	NA	2,683	Harza Engineer. Co.
Jiroft .....	Arched concrete	Tang-e-narab	130.0	500	1981	1,244	Scetiran Stocky & Atras
Minab .....	Concrete	Minab	53.0	404	1981	2,275	" " "
Lar .....	Earth	N. of Polur	105.0	960	1979	11,850	Alexander Gibbs Ltd.
Saveh .....	Arched concrete	Saveh	88	290	1981	1,300	Hydro Energetic Rumania

Source: Ministry of Energy.

**Table 7.—Iran: Sewage Treatment and Water Supply Projects under Implementation by the Ministry Housing and Urban Development, 1975/76**

Location	Project Description	Cost (U.S. Dollars)	Consulting Engineers
<b>Sewage Treatment</b>			
Ahvaz .....	Sewage treatment plant	3,748,000	Irendco
Amlesh .....	Sewage	639,100	Ministry
Arak (center) .....	Water supply and waste disposal	624,000	Ministry
Behbahan .....	Sewage treatment plant	454,000	Adibi Harris Company
Gonbadan .....	Sewage	43,000	Ministry
Parsavar .....	Sewage	176,000	Ministry
<b>Water supply</b>			
Bandar Pahlavi .....	Water supply	71,100	Kuros Company
Darab .....	Water supply	340,000	Adibi Harris Company
Marand .....	Water supply	269,000	Honor
Mahmoudabad .....	Water supply	326,000	Method
Shirvan .....	Water supply	200,000	Pars Consulting Company
Torbat Heydariyeh .....	Water supply	198,000	Pars Consulting Company

Source: Ministry of Housing and Urban Development.

the private sector for residential construction, and the only government agencies active in the construction of housing were the armed forces. Failure of the private sector to build sufficient housing units, rapid urbanization, and demand for improved housing resulting from increasing income led the Government to give increased attention to housing, particularly following the increase in oil revenues in 1973. At the beginning of the Fifth Plan period (March 1973), the deficit in urban housing was estimated at over 1.1 million units. The Fifth Plan projected the construction of 810,000 new units, of which the private sector was to build 550,000.

In 1974 the Government established the Mortgage Bank and the Construction Bank to provide financing for residential construction. The Mortgage Bank drafted plans for a 25-year housing project, which stated that during 1974–1986 the Government would

make available over 36% of all credits needed to allow for the building of 2.8 million new dwellings.

Government housing projects include low-cost through luxury housing, special housing complexes designed for workers in government agencies and state enterprises, new towns and satellite cities, and a wide range of other facilities (see tables 8 and 9). Government plans include the building of two "new town" complexes in Tehran: Farahzad, in cooperation with Starrett Corporation (U.S.), and Shahrestan Pahlavi. Land-leveling began in 1975 at Shahrestan Pahlavi, an area of barren land located in northern Tehran, and contracts for building construction are slated to be finalized by the beginning of the Sixth National Development Plan. The total cost of the project is expected to be over \$1.2 billion. When completed in 1984 or 1985, the complex will house some 100,000 persons. Other projects in-

**Table 8.—Iran: Major Town and Large Residential Construction Projects, 1976**

Sponsoring Organization	Location	Project	Investment (millions) of U.S. dollars)	Status
Ministry of Housing & Urban Planning .....	Dezful,	18,000 homes	\$ 309.0	1978 start
Khuzistan Housing & City Planning Office ....	Khuzistan			
	Various	1,916 homes	\$ 66.7	Under construction
Khuzistan Housing & City Planning Office ....	Locations			
Jondi Shahpur University .....	Ahvaz	4,595 homes		Under construction
Bank Markazi Iran (Central Bank of Iran) ....	University	1,496 houses	\$ 45.4	1979 completion date
Iranian Navy .....	Shiraz	2,150 houses	N.A.	1978 start
	Tehran	Housing complex	N.A.	1980 completion
		2,060 apts.	N.A.	Under construction by Tessa Co.
Shiraz Municipality .....	Shiraz	5,000 apts.		
Mafinabad Town .....	Saveh	28,000 houses	N.A.	1977 start
Kurosh Industrial City .....	Saveh	25,000 houses	N.A.	1978 start
Tehran University .....	Tehran	500 teachers homes	N.A.	1977 start
Bahar Co. ....	Tehran	4,000 worker homes	\$ 78.1	1977 start
Ahvaz Governorate .....	Ahvaz	2,300 homes	N.A.	1979 completion
Tehran Municipality .....	Tehran	Satellite Town	\$1,200.0	1985 completion
		(Shahrestan Pahlavi)		
		for 100,000 people		
Farahzad Town .....	Farahzad	Satellite Town	\$1,000.0	1980 completion
National Iranian Copper Co. ....	Kerman	Satellite Town	N.A.	1978 completion
Persian Gulf Shipping Co. ....	Gachin	3000 units	N.A.	1978 start

Source: Ministry of Housing and Urban Planning, trade interviews.



**Table 9.—Iran: Government Allocations for Housing Projects 1976/77**  
(millions of U.S. dollars)

Government Organization	1976 Budget Allocation	1977 Budget Allocation
<b>Government Employee Housing</b>		
Ministry of Housing and Urban Planning ..	522.1	750.8
Atomic Energy Organization of Iran .....	0	11.2
Imperial Gendarmarie .....	8.5	9.9
Industrial Development & Renovation		
Organization (IDRO) .....	2.8	5.1
National Iranian Radio and Television (NIRT) .....	2.1	8.1
Revolutionary Corps .....	2.0	2.8
Housing Organization .....	3.8	2.8
Ministry of Agriculture & Natural Resources	0	2.8
Ministry of Court .....	2.6	2.6
Aryamehr University, Tehran .....	0	1.4
Customs Organization .....	.7	1.0
<b>Total Government Employee Housing Credits</b>	<b>544.6</b>	<b>792.7</b>
<b>Worker Housing</b>		
IDRO .....	36.2	103.9
Kerman Copper Co. ....	14.2	59.6
National Iranian Steel Co. ....	38.3	53.2
Ministry of Housing & Urban Planning ....	9.3	29.1
Khuzistan City Planning Organization.....	42.6	29.0
Red Lion & Sun Society .....	22.7	21.7
National Iranian Steel Industries Corp.....	4.3	14.2
Arya Cement Co. ....	0	4.3
<b>Total Worker Housing Credits</b> .....	<b>168.3</b>	<b>315.7</b>
<b>Low Income Housing</b>		
Ministry of Housing & Urban Planning ....	61.8	93.0
Mortgage Bank .....	0	9.9
Hormozghan Governorate .....	5.0	9.2
Workers Welfare Bank .....	5.0	7.3
Housing Organization .....	1.1	1.6
Sistan & Baluchistan Governorate .....	0	1.1
<b>Total Low Income Housing</b> .....	<b>72.9</b>	<b>122.1</b>
<b>Total Government Housing Allocations</b> .....	<b>785.8</b>	<b>1,230.5</b>

Source: Official Iranian budgets, 1976/77, 1977/78.

clude the setting up of 5–10,000 prefabricated dwellings financed through the Construction Bank, and numerous apartment complexes for low-income families in southern and western Tehran, as well as in other large cities. To provide housing for workers and government employees, government agencies are constructing housing complexes in the cities of Shiraz, Dezful, Saveh, Bandar Abbas, and on Kharg Island.

The Housing Organization, a government agency, has funded numerous building projects throughout the country, ranging from luxury apartments to low-cost worker housing. In 1976, it allocated \$1.2 million for construction of low-cost housing, and \$3.8 million for construction of housing complexes for government employees. These complexes generally consist of high-rise apartment buildings of 5 to 18 stories. The Housing Organization has contracts with Kessling AG. (West Germany) for design and construction, and with Buick Cie. (France) for production of prefabricated concrete slabs.

## Infrastructure Projects

**Electric Power.**—In the years 1975 through 1982, an estimated \$1.5 billion will be spent on the con-

struction component of new power plant projects in Iran. Almost half the expenditures are expected to be devoted to four nuclear plants planned in the southern part of the country. One of these nuclear projects, to be built near the city of Halileh, will also include the construction of 5,000 housing units, water treatment facilities and government offices. Six thermal power plants which have been contracted since 1974 will involve large construction expenditures during 1976–1979 (see Electric Power chapter).

**Transportation.** — Several construction projects were under way in 1976 designed to improve and expand Iran's port facilities, and additional contracts were slated to be signed. Key projects include construction of a new harbor near Bandar Abbas and expansion of Bandar Shahpur. The projects include dredging, construction of jetties, berths, container handling facilities, special handling facilities for ore and grain, and warehousing, as well as auxiliary facilities such as housing, electric power plants, water supply, etc. The Fifth Plan allocated \$1.2 billion for port construction and expansion projects to be completed or initiated during the Plan period. The Ports and Shipping Organization of the Ministry of Roads and Transport is responsible for the operation and development of Iran's ports.

Airport construction and expansion were allocated \$378 million in the Fifth Plan. The major project incorporated in the plan is construction of a new \$800 million international airport in Tehran: land preparation work was underway in 1976. Expansion of regional airports was also planned.

The Ministry of Roads and Transport plans to build an estimated 10,000 kilometers of asphalt or concrete roadway during 1976–85. A major four-lane highway running from Bandar Shahpur to Tehran will be built starting in 1978, at a cost of over \$200 million. The Iranian National Railways Corporation has plans to build over 10,000 kilometers of new track under a 20-year development plan drafted in 1974/75 (see Transportation chapter).

## Industrial Development

**Mining, Petroleum, and Natural Gas.**—Capital investment in oil and gas exploration, production, transportation and distribution is expected to average about \$1.5 billion annually during 1976–80. The largest single project is the construction of a second natural gas pipeline from the Persian Gulf to the U.S.S.R. border at a cost of over \$2.6 billion. Other gas, crude oil and products pipelines are either under construction or planned. Substantial infrastructure development will be required to bring new oil and gas fields into production, to implement plans for secondary recovery through natural gas injection, and to develop new storage and other handling fa-

cilities. Completion of the extraction, concentration and refining stages and the infrastructure facilities of the Sarcheshmeh Copper project will be followed by construction of secondary copper manufacturing facilities (see Mining, Petroleum and Natural Gas Extraction chapter).

**Chemical Industries.**—Expansion underway in Iran's state-owned petrochemical industry, coupled with new projects such as the Iran-Japan Petrochemical Co. project, which is estimated to total over \$1.8 billion, will make the Iranian chemical industry one of the major areas of construction activity throughout 1976–86. There are over a dozen additional petroleum refineries and petrochemical plants which are in various stages of planning for construction during this period (see Chemical Industries chapter).

**Primary Metals Industries.**—The Government is increasing basic steel production through the expansion of the Soviet-built Aryamehr steel complex and the construction of four direct reduction steel plants. These projects include construction costs of over \$1 billion. The planned \$50 million privately owned Kavian Steel Mill will also be a major construction project. Planned investments in the primary metals industry will make it one of the major contributors to growth of construction activity during 1976–1986.

**Other Industries.**—The construction of two government-owned wood processing complexes, that of the Iran Wood and Paper Industries in Mazandaran and the Gilan Wood and Paper Industries in Gilan, will result in substantial building construction as well as road building and forest clearing. Of the \$200 million total capital investment in Gilan, about 50% is to be for equipment, while the remainder is to be for construction and other costs. The development of the 29,000 ha Reza Pahlavi Industrial Estate near Esfahan, at a total cost of some \$3.5 billion over a period of about 15 years, will include construction of manufacturing plants, housing and other infrastructure. Expansion plans in the textile, food processing and packaging, electronics production, and metal fabrication industries will also result in significant construction activity.

## Commercial Construction

Commercial buildings are built and owned by the private sector, although many are leased to government agencies to house expanding staffs. Since 1975, the Government's policy has been for government organizations to have their own buildings constructed rather than compete with the private sector for space.

The private sector built an estimated 10,000 units of office space during 1975. Most buildings were five

or more stories and constructed specifically as office buildings.

**Hotels and Tourism.**—About 500,000 tourists visited Iran in 1975. There were 413 classified hotels in the country with about 25,650 beds; however, most of these were not up to international standards. The Government has initiated a program to develop tourism at historical sites like Esfahan, Shiraz and Mashhad, as well as on the Caspian Coast. To accommodate the influx of tourists and business travelers, projected to reach over 1 million persons in 1978, the Government is building hotels as well as encouraging the private sector to invest in tourist facilities. Government allocations for hotels and tourist facilities increased from \$22.7 million in 1974 to \$53.4 million in 1976. The Fifth Plan projected that the number of beds in luxury class hotels would be increased from 6,250 in March 1973 to nearly 22,000 by March 1978.

Major hotel construction projects underway in 1976 included the 500-bed Evin Crown Hotel in Tehran, an 80-room hotel in Khorramshahr being built at a cost of \$2.4 million, and a 200-bed hotel in Kashan representing an investment of \$3.9 million. The Ministry of Information and Tourism has undertaken to build and operate five hotels with a total of 590 rooms, costing \$3.5 million, to be located in Tabriz, Saveh, Rudsar, Gorgan and Nowshahr. Blount Brothers International (U.S.) is the prime contractor for a 40-story expansion of the Tehran AryaSheraton Hotel, scheduled to begin in 1977.

## GROWTH PROSPECTS

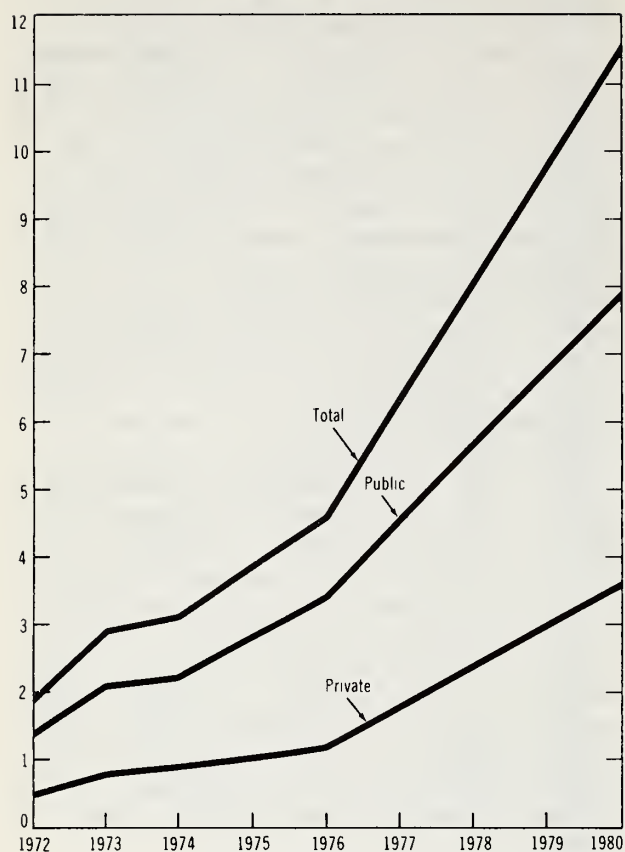
The average annual growth rate projected for total investment in construction during 1975–80 is about 21%. This rate represents a leveling off from the extraordinarily high rates sustained during 1973–75, as the Iranian economy settles into a more normal pattern of growth. The private sector's share of total investment in construction (28% in 1975) is expected to increase to about 34% by 1980 (see Figure 1). The most significant growth in new construction is expected to be in private-sector residential buildings. The value of private residential buildings put in place is projected to increase by over 240% between 1976 and 1980, as government programs designed to stimulate private investment in residential construction begin to take effect.

The Government allocated over \$1.2 billion in the Fifth Plan to be used for the construction of new government buildings. During the first 3 years of the Fifth Plan period, spending for public buildings actually amounted to over \$2 billion. Spending on new housing for workers in state-owned factories



Figure 1.—Iran: Value of new construction  
1972-1980

(in billions of U.S. dollars)



and for civil servants will total over \$3 billion during the Fifth Plan period. Over \$5 billion will be spent during the Fifth Plan period on urban development.

While critical shortages of basic building materials and of capital required for construction appeared to have been alleviated by 1976, the deficit in new housing is likely to continue to exist through 1980. Construction activity is expected to develop at a high level as a result of increased investment in residential building by both the private and public sectors, a high rate of investment in new and expanded plant by industry, and continued high levels of investment in infrastructure by the Government.

## CAPITAL GOODS MARKET

Total sales of construction equipment and building products grew from just over \$1 billion in 1973 to \$2.2 billion in 1975. Of this total, sales of building products—including cement, lumber, structural steel, air-conditioning, plumbing and heating equip-

ment, and builders' hardware—accounted for about \$1.5 billion in 1975 (see table 10). The 47% average annual growth rate of total sales which characterized 1973-75 has not been maintained; the rate slowed in 1976 to a more sustainable 17%, and the total market is expected to be about \$4.7 billion in 1980. Of this figure, sales of building products are projected at about \$3.7 billion, while sales of construction equipment are expected to be about \$1 billion.

Domestic manufacturing of construction equipment and building products is increasing. Domestic manufacturers, who supplied less than 1% of Iranian purchases of construction equipment in 1975, are expected to account for about 6% of sales in 1980. Domestic producers of building products supplied almost 60% of Iranian requirements in 1975; by 1980 their share of sales is expected to be over 70%.

## Imports

Total Iranian imports of construction equipment rose from about \$156 million in 1973 to over \$632 million in 1975. The largest components of this increase were excavation machinery and construction cranes, which represented over one-third of total construction machinery imports by value in 1975. Other major imported equipment categories included construction tractors, which represented 20% of all 1975 imports; and concrete and other building products production equipment, including machinery for making asphalt, cement, brick and other building materials, imports of which grew from \$27 million in 1973 to \$91 million in 1975. Total construction equipment imports are projected to reach about \$965 million by 1980, growing an average of 6% per year during 1976-80.

U.S. suppliers dominated the market for construction equipment in 1975 with \$220 million in sales, an amount representing almost one-third of all imported construction equipment that year. U.S. suppliers sold a significant share of almost all equipment categories, accounting for 41% of the excavation equipment and 49% of construction tractors imported in 1975. U.S. manufacturers provided nearly 20% of all road rollers and 15% of imported concrete and building products production equipment.

West German suppliers accounted for 19% and over \$119 million in sales of imported construction equipment in 1975, including 45% of imported concrete and other building products production equipment. West German suppliers sold 25% of all construction cranes imported in 1975, valued at over \$29 million.

**Table 10.—Iran: Size of the Market for Construction Equipment and Building Products**  
(thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>BUILDING PRODUCTS</b>					
Domestic Production .....	599,600	794,500	907,000	1,087,000	2,734,000
Imports .....					
United States .....	23,325	44,580	132,619	86,000	110,000
West Germany .....	26,357	39,537	54,584	—	—
Japan .....	7,835	17,607	17,264	—	—
United Kingdom .....	14,404	21,943	34,046	—	—
Others .....	214,079	432,333	433,487	—	—
Total .....	286,000	556,000	672,000	768,000	1,057,000
Exports .....	13,470	15,342	18,300	23,000	50,000
Market Size .....	872,130	1,335,158	1,560,700	1,832,000	3,741,000
<b>CONSTRUCTION TRACTORS</b>					
Domestic Production .....	—	—	—	—	—
Imports .....					
United States .....	7,680	6,739	65,370	73,000	90,000
Japan .....	17,143	8,024	32,803	—	—
United Kingdom .....	6,649	6,184	13,260	—	—
France .....	78	13	10,799	—	—
Others .....	2,873	3,531	10,589	—	—
Total .....	34,423	24,491	132,821	171,000	210,000
Exports .....	—	—	—	—	—
Market Size .....	34,423	24,491	132,821	171,000	210,000
<b>EXCAVATING &amp; LEVELING MACHINERY</b>					
Domestic Production .....	60	200	382	1,500	18,000
Imports .....					
United States .....	28,526	35,659	89,886	77,000	55,000
United Kingdom .....	2,217	6,990	18,932	—	—
West Germany .....	2,494	7,728	23,065	—	—
Japan .....	5,713	4,922	26,642	—	—
Others .....	9,740	16,453	59,431	—	—
Total .....	48,690	71,752	217,956	204,000	270,000
Exports .....	—	—	—	—	—
Market Size .....	48,750	71,952	218,338	205,500	288,000
<b>ROAD ROLLERS</b>					
Domestic Production .....	—	—	—	300	19,000
Imports .....					
United States .....	201	2,306	7,538	9,600	16,000
Japan .....	1,027	3,115	9,130	—	—
West Germany .....	2,060	5,757	12,270	—	—
United Kingdom .....	857	858	3,207	—	—
Others .....	1,273	1,910	5,763	—	—
Total .....	5,418	13,946	37,908	57,000	58,000
Exports .....	—	—	—	—	—
Market Size .....	5,418	13,946	37,908	57,300	77,000
<b>CONCRETE AND OTHER BUILDING PRODUCTS MAKING EQUIPMENT</b>					
Domestic Production .....	70	150	300	600	2,000
Imports .....					
United States .....	2,786	2,901	13,482	15,000	18,000
West Germany .....	19,906	14,359	41,370	—	—
Italy .....	1,282	2,616	7,148	—	—
United Kingdom .....	1,698	3,428	7,865	—	—
Others .....	2,079	14,178	21,769	—	—
Total .....	27,751	37,482	91,634	132,000	185,000
Exports .....	—	—	—	—	—
Market Size .....	27,821	37,632	91,934	132,600	187,000
<b>CONSTRUCTION LIFTING AND LOADING EQUIPMENT <sup>2</sup></b>					
Domestic Production .....	180	381	3,390	7,150	11,900
Imports .....					
United States .....	4,137	6,784	38,646	27,000	39,000
United Kingdom .....	2,275	4,635	9,287	—	—
Japan .....	727	2,705	5,363	—	—
France .....	2,629	4,604	12,298	—	—
West Germany .....	4,932	11,247	29,082	—	—
Others .....	3,106	7,769	14,956	—	—
Total .....	17,806	37,744	109,632	135,850	158,100
Exports .....	—	—	—	—	—
Market Size .....	17,986	38,125	113,022	143,000	170,000



**Table 10.—Iran: Size of the Market for Construction Equipment and Building Products—Continued**  
(thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>OTHER CONSTRUCTION MACHINERY AND EQUIPMENT <sup>4</sup></b>					
Domestic Production .....	387	970	1,800	3,000	10,000
Imports .....					
United States .....	1,667	3,248	4,657	6,980	9,000
Japan .....	3,307	5,230	5,120	—	—
West Germany .....	7,243	8,836	11,425	—	—
United Kingdom .....	2,473	4,392	6,318	—	—
Others .....	7,450	8,046	14,982	—	—
Total .....	22,140	29,752	42,502	59,300	84,000
Exports .....	—	—	—	—	—
Market Size .....	22,527	30,722	44,302	62,300	94,000
<b>TOTAL MARKET FOR CONSTRUCTION EQUIPMENT AND MATERIALS</b>					
Domestic Production .....	600,297	796,201	912,872	1,099,550	2,799,900
Imports .....					
United States .....	68,322	102,217	352,198	294,580	337,000
West Germany .....	63,410	88,464	173,796	—	—
United Kingdom .....	30,573	48,430	92,915	—	—
Japan .....	35,752	41,603	96,322	—	—
U.S.S.R. ....	99	149	11,723	—	—
Others .....	244,072	490,304	577,499	—	—
Total .....	442,228	771,167	1,304,453	1,527,150	2,224,100
Exports .....	13,470	15,342	18,300	23,000	50,000
Market Size .....	1,029,055	1,552,026	2,199,025	2,603,700	4,767,000

<sup>1</sup> Estimates.

<sup>2</sup> Includes blockmaking equipment, asphalt and cementmaking equipment, forms and slab for precast and prefabricated concrete products, bricks, kilns.

<sup>3</sup> Includes tower cranes, mobile and truck-mounted cranes, winches, and forklifts.

<sup>4</sup> Includes equipment such as cement-mixing equipment, welding equipment, plaster mixers, metalfinishing equipment, compactors/vibrators, elevators, compressors.

Source: United Nations, Organization for Economic Cooperation and Development, supplier country and official Iranian trade statistics; estimates based on trade interviews.

Japanese firms supplied 12% of construction equipment imports in 1975, and they were especially strong in the sales of construction tractors, accounting for almost one-quarter of these imports.

## Building Products Market

Sales of building materials have grown steadily in the 1970's as a result of the rapidly increasing construction activity. According to data released by the Ministry of Housing and Urban Planning, consumption of building products and materials rose at an average annual rate of 26% from just over \$1 billion at market prices in 1973 to over \$1.6 billion in 1975 (see table 11). The chief components of this increase were building stone, cement and gypsum products, pipe products and steel beams, which together accounted for 72% of total consumption in 1975 (see table 12). Consumption of fabricated structural metal products grew most rapidly, increasing at an average annual rate of about 45%. In 1975-80, the demand for building components is expected to grow at a rate of approximately 18% per year, reaching about \$3.9 billion in 1980.

The Government's objective is for Iran to achieve self-sufficiency in the production of basic building materials. In 1976, domestic manufacturers supplied

about 80% of all basic materials used in the construction industry and 100% of the country's requirements of ceramic tiles, glass, steel pipe, aluminum profiles, sanitary ware, and tar products. Imports of basic materials in 1976 comprised primarily iron and steel profiles, woden products, brick products and cement. The expansion of steel and cement production should make Iran almost 90% self-sufficient in basic building materials by 1980. The majority of building products imported in 1976 were specialized and decorative items which are not manufactured domestically. Building products imports grew from \$286 million in 1973 to \$672 million in 1975, and they are projected to reach over \$1 billion in 1980.

U.S. firms supplied over 19% of imported building products in 1975. They led all foreign suppliers in sales of air-conditioning equipment, accounting for more than \$13 million, or over one-half of total Iranian imports of this equipment in 1975. U.S. firms also supplied insulated wire and cable valued at \$20 million in 1975, representing almost 28% of these imports. Imports of seamless tubes and pipes totaled over \$238 million in 1975, of which U.S. companies provided almost \$90 million, or nearly 38%.

West German firms sold building products valued at over \$54 million to Iran in 1975, representing

**Table 11.—Consumption of Major Building Products in Iran<sup>1</sup>**  
(millions of U.S. dollars)

Category of Products	1973	1974	1975	1976	1980
Building stone, cement and gypsum products ..	352.7	517.4	547.0	665.5	1,932.1
Wood and plywood products .....	76.8	104.3	139.6	164.5	247.2
Fabricated structural metal products .....	41.2	64.9	86.3	110.7	186.5
Steel beams .....	220.0	272.0	320.0	396.0	632.0
Builders hardware .....	21.2	36.7	39.2	47.1	56.9
Pipe products .....	180.2	308.9	330.6	384.2	509.5
Miscellaneous building products .....	151.6	175.4	201.4	232.9	416.6
	1,043.7	1,479.6	1,664.1	2,000.9	3,980.8

<sup>1</sup> Totals differ from those in Table 10 because they represent estimates of actual sales at domestic market prices.

Source: Housing Organization.

over 8% of these imports. German suppliers were especially strong in the sales of plumbing and heating equipment, accounting for sales of nearly \$20 million in 1976. West German suppliers also sold over \$13 million of insulated cable and wire in 1975, representing over 18% of total imports of these items.

Japanese suppliers accounted for over 5% of building products imports in 1975, with sales amounting to \$34 million. They sold seamless tubes and pipes used for plumbing, heating and utilities, valued at almost \$14 million, and were also significant suppliers of builders hardware, screws and nails.

Iran imported 1.2 million tons of cement products in 1975, valued at \$77 million, primarily from Turkey, India and South Korea. Wood and plywood product imports totaled over \$31 million in 1975, mostly from the U.S.S.R., Italy and Austria. Imports of iron and steel profiles, primarily from Japan, West Germany, Spain and Belgium, totaled \$270 million in 1975.

## Domestic Manufacturing

In 1975, domestic output of construction equipment in Iran was valued at about \$5.8 million. The

Arak Machine Manufacturing Co., a subsidiary of the Industrial Development and Renovation Organization, is a large machine job-shop which produces mobile and fixed construction cranes under license from Poclain S.A. (France) and P&H (U.S.). HEPCO, established in 1972, is a private company assembling bulldozers, loaders, graders, and road rollers under license from several foreign companies, including International Harvester Company (U.S.). HEPCO concluded an agreement to assemble \$5 million worth of road rollers beginning in 1977 with Sakai Works Co. Ltd. (Japan). Also in 1977, Akam Building Company, a subsidiary of the private-sector Behshahr Industrial Group, will begin assembling cranes under license from Morris Ltd. (U.K.).

Other domestic manufacturers of construction equipment include Techno-Is Company, which manufactures batching plants, truck mixers and concrete-making equipment, and Delta-Kar Company, which manufactures a line of concrete mixing machines and conveyor systems for building materials quarrying operations. Basic construction machinery, such as dumpers and materials buckets, are manufactured by a large number of small workshops on a job-shop basis.

There are approximately 2,000 domestic manufacturing companies which supply building products for the construction industry in Iran. The largest number make stone, clay, cement, and gypsum products. These include 350 brick factories and 800 workshops producing handmade bricks. An estimated 10 billion bricks were produced in 1975, of which about 20% were machine-made, almost all using Hoffman kilns from West Germany, while the rest were made by hand. Iran's 12 cement plants produced 5.4 million tons of cement in 1975 (see table 13). All of these plants used German equipment and technology. New investment has been encouraged by the Government in an effort to boost cement production to an estimated 25.4 million tons by 1980. In 1975 licenses were granted for 10 additional plants; however, as of early 1977 only two firms had begun construction, in light of current

**Table 12.—Iran: Estimated 1976 Consumption of Major Building Materials**

Type Material	Unit	User		1976 Demand	Domestic Production	% Self-Sufficiency
		Private	Government			
Cement .....	mil. tons	3.9	5.5	9.4	6.3	67
Iron and profile .....	thous. tons	1,195.0	1,138.0	2,333.0	573.0	24
Brick .....	Billions	10.6	2.1	12.7	9.6	75
Gypsum .....	mil. tons	3.5	0.7	4.2	3.8	90
Tiles .....	mil. tons	378.0	74.0	452.0	497.0	110
Glass .....	thous. tons	60.0	12.0	72.0	160.0	222
Wooden products .....	thous. tons	670.0	134.0	804.0	601.0	74
Aluminum profiles .....	thous. tons	21.0	4.0	25.0	25.0	100
Galvanized steel pipe .....	thous. tons	67.0	13.4	80.0	140.0	175
Tar .....	thous. tons	77.0	23.1	100.0	11.5	100
Sanitaryware .....	thous. tons	9.6	0.8	10.4	12.4	110

Source: Ministry of Housing and Urban Planning.



**Table 13.—Iran: Cement Plants, 1976**

Company	Location	Daily Capacity (tons)
Ab-Yek Cement Factory .....	Ab-Yek	3,500
Tehran Cement Co. ....	Tehran	3,200
Fars Cement Factory .....	Shiraz	2,000
Dorud Cement Factory .....	Dorud	2,000
Kerman Cement Co. ....	Kerman	1,300
Esfahan Cement Co. ....	Esfahan	1,000
Rey Cement Co. ....	Rey	600
Mashhad Cement Co. ....	Mashhad	600
Sofian Cement Co. ....	Tabriz	600
Japrod Cement Factory .....	Jajrod	400
North Cement Co. ....	Tehran	300
Loshan Co. ....	Loshan	300

Source: Trade interviews.

projections that domestic production of cement will exceed demand by 1980.

Production of gypsum plaster reached 3.4 million tons in 1975. Domestic production supplies all equipments. While almost half the production is centered near Tehran, two plants producing 600,000 tons annually of gypsum plasterboard (drywall) are located in the towns of Damavand and Ahvaz.

Three domestic firms produced 90,000 tons of asbestos sheets and 100,000 tons of asbestos pipe in 1975, and their combined production virtually satisfied total requirements. Asbestos sheeting is rapidly displacing corrugated sheet steel roofing. The increased use of central heating heating in homes is stimulating growth of the market for asbestos pipe products. In 1980 the total demand for asbestos cement products is projected to grow to 418,000 tons, and shortages are likely to develop.

There are four domestic producers of sanitary fixtures: Mina Mfg. Company, Parceram Mfg. Company and Iran Polypex, a producer of acrylic sanitary ware. The fourth manufacturer, Pars Metal Company, began operations in 1975, and produced over 1,800 tons of enameled iron sanitary fixtures in its first year. Manufacturing of sanitary fittings is primarily done by small workshops.

In 1975 only three companies delivered ready-mixed concrete. By early 1977, there were over 15 companies operating concrete batching plants and delivering cement to job sites. The increase in the number of large buildings constructed of concrete indicates that more of these firms will be established during the next few years. Precast blocks and slabs are produced by Prefab Company, Akam Precast Concrete Company, and four other Iranian producers.

Steel consumption in 1975 included an estimated 590,000 tons of I-beams and structural steel. The National Iranian Steel Company's Esfahan steel complex is the only Iranian producer of structural steel. As a result of the expansion of the Esfahan complex and the output of four direct reduction steel

mills which will be completed during 1977-79, Iran should become self-sufficient in structural steel by 1980. There are 25 firms manufacturing fabricated metal building products (see Metallurgical and Metalworking Industries Chapter).

The use of wood products in construction is quite limited in Iran. Few wooden homes exist in Iran, and even window frames are normally made from fabricated steel. Over 200 firms in Iran supply wood products to the construction industry, including eight door manufacturers. An additional five door manufacturing companies have been formed and will begin production by 1978. The largest door producer, Sentab Sventha Iran, is a Swedish-Iranian joint venture which manufactured 10,000 doors in 1975. Imports of wooden doors grew in value from \$1.8 million in 1973 to over \$4.2 million in 1975. Because builders favor imported doors over those domestically manufactured, imports will continue to grow despite increasing domestic production.

As a result of new home construction and other building activities, the market for builders hardware and locks in Iran is expected to grow by approximately 20% annually during 1975-80. Domestic production accounted for only 15% of all builders hardware used in the country during 1975. Iran has two lock producers who together made 2.5 million locks in 1975. Hinges, fittings and other hardware are produced in small workshops, but imports continue to supply most requirements.

Iran has four major glass manufacturers, 23 paint producers, and eight major producers of wall coverings. The major glass companies supplied over \$34 million worth of glass to the construction industry in 1975. Qazvin Glass Co. the largest producer, is a joint venture between Iranian interests and Nippon Sheet Glass Co. Ltd. (Japan), while Abjuineh Glass Co., another major company, is an Iranian joint venture with Glaverbel S.A. (Belgium). A total of 80 firms manufacture plumbing, heating and pipe products. This number includes one heating pipe producer, and two manufacturers of seamless steel pipes for gas and oil lines. There are 15 radiator manufacturers, seven firms fabricating water heaters, and two firms making boilers, along with other firms making plumbing fixtures and pressure pipes.

Sales of air-conditioning equipment grew from \$33 million in 1973 to \$63 million in 1976. Domestic production supplies approximately 40% of the market. Evaporative coolers, which also humidify the air, are the most common type of air-conditioning devices used in Iran. The Arj Corp. and Azmayesh Co. accounted for over \$12.2 million worth of domestically assembled evaporative coolers in 1975. The one Iranian manufacturer of window air-conditioning equipment is a joint venture between Carrier Corporation (U.S.) and a private Iranian firm, Sholeh Khavar Co.

## MARKET OPPORTUNITIES

During 1976–80, good sales opportunities will exist for the following products and services:

**Construction Equipment.**—Sales of cranes, excavating and land-leveling equipment will increase well into the 1980's. Requirements for specialized equipment, such as backhoes for pipeline construction and pavers for bituminous materials in road construction, will continue to exist. Other equipment, such as road rollers and graders, will be manufactured in Iran and their importation will thus be limited.

**Building Materials Production Equipment.**—The large increases in construction activity and the growing number of infrastructure projects will require the use of portable batching plants for bitumen and concrete, as well as portable blockmaking equipment that can be used at the construction site. The use of ready-mix cement, and truck-mounted mixers to pour concrete for high-rise buildings will be increased.

**Building Products.**—While domestic manufacturers supply most of the basic building materials used in Iran's construction industry, significant opportunities exist for the sale of specialized, high-quality building materials, and also those that are in chronic short supply. The following will be in greatest demand during 1976–80: all types of fittings, hinges, fabricated metal products, locks, and builders hardware; high-quality fittings for sanitary fixtures; air-conditioning equipment; and all types of plumbing and heating equipment, including pipes.

**Technology and Service Opportunities.**—Excellent opportunities exist for manufacturers of prefabricated buildings, modules, and structural components to sell or license production technology, or to participate in building projects on a joint-venture basis. New building techniques which offer savings in construction time for high-rise structures will also find a good market in Iran. Iranian design and engineering companies will require specialized building skills to manage the large projects slated to be built during 1976–86. Foreign firms specializing in the design and construction of roads and dams, nuclear power stations, airport facilities, and other specialized structures will find increasing opportunities to establish associations with Iranian consulting and engineering firms.

### Buyers Universe

The major buyers of construction equipment are the approximately 600 contractors who perform much of the government and private building in Iran. Generally the contractor is responsible for procur-

curing all equipment and building materials on behalf of the client for large projects. Construction companies operating in Iran generally own the equipment used on their projects and shift this equipment from job to job. Equipment leasing, however, is gradually gaining acceptance in Iran. For residential construction, contractors normally require the owner to purchase building materials.

In the case of large civilian projects funded by the Government, the contractor must supply all equipment. To the extent he does not acquire the equipment in Iran, he must import it himself and pay all applicable duties and taxes. The contractor for the Tehran gas pipeline project, for example, was obliged to import much of his equipment, but he will be allowed to sell it in Iran after the project is completed. In the case of military construction projects, the equipment is purchased by the Government and imported free of customs duties.

The Government, through the Plan and Budget Organization, establishes cost limits for public-sector construction projects and issues annual guidelines for construction labor rates, materials costs and profit margins.

### Foreign Suppliers Universe

Approximately 70 foreign firms supply construction equipment to the Iranian market and several hundred supply building products.

The major suppliers of truck-mounted construction cranes include Tadano Company and Kato Ltd. (Japan), Demag GmbH (West Germany), and Link-Belt, Syntron, and Detroit Power Screwdriver Equipment (a subsidiary of FMC Corporation) (U.S.). Sales of construction building cranes for high-rise structures are dominated by Poclain S.A. (France), Harnischfeger Corp. (U.S.) and Ingersoll-Rand Co. (U.S.). Other crane suppliers include Grove Manufacturing Company, a division of Walter Kidde & Co., Inc. (U.S.), and Herbert Morris Ltd. (U.K.). The major excavator suppliers include Caterpillar Tractor Company, which also supplies bulldozers, scrapers and graders, JB Machinery Co. Inc., Clark Equipment Co. and J.I. Case Company, (all U.S.). Bulldozers are supplied by Massey-Ferguson Ltd. (Canada), Komatsu International Manufacturing Co., Ltd. (Japan), and International Harvester Co. (U.S.) The market for backhoes is dominated by Barber-Greene Company (U.S.), and J.I. Case Corp. (U.S.), and Massey-Ferguson Ltd.

Batching plants and mixing plants are sold by Challenge-Cook Bros. Inc. (U.S.), Rossbeton S.p.A. (Italy), and Lambert Ltd. (U.K.). Asphalt plants are sold by Miller Ltd. and Parker Ltd. (U.K.).

Leading suppliers of portable power tools include Bosch (Germany) and Black and Decker (U.S.). Hand tools are sold by Sun Tools Co. (U.S.), Heylo



(Germany), Oberg (Sweden), Weller (Italy), and Noriske (Sweden).

Representative of successful suppliers in the very competitive building products market are: Twyford and Shanks (U.K.), sanitary ware: Yale (U.S.), locks; A.E.G. (Germany), electrical outlets; Imperial Chemical Industries (U.K.), paints; American Standard and Kohler (U.S.), plumbing fixtures; Westinghouse Electric, Carrier Corp., and Trane Corp. (U.S.), and Daikin (Japan), air-conditioning equipment; Ardel (Italy) and Kosan (Denmark), water-heaters; as well as Chaleur (France), furnace burners.

## Marketing Factors

Most foreign firms active in sales of building products and construction equipment to the Iranian market make exclusive representation agreements with local importers and distributors. Some firms that have assembly plants in the country, such as International Harvester, Massey-Ferguson, and Deere and Co., use the marketing channels established in connection with these operations to sell other products. Massey-Ferguson, which signed an agreement with the Iranian Government in 1975 for the manufacture of agricultural tractors in Tabriz, uses the marketing channel established in connection with that operation to market its complete line of earth-moving and other construction-related equipment. Other firms have found licensing Iranian firms to assemble or manufacture their equipment an effective means of assuring long-term sales. Most foreign consulting, engineering and construction firms have found it desirable to associate with an Iranian counterpart either on a project basis or under a long-term arrangement.

Although equipment leasing is gaining acceptance, particularly among smaller and medium-sized contractors, most construction equipment is still being purchased as needed. Industry sources state that the development of leasing has been handicapped in Iran by the shortage of qualified equipment operators and service personnel and the consequent abuse of equipment; however, some suppliers provide leasing services, and several specialized equipment leasing companies operate in Tehran.

Construction equipment is purchased in Iran primarily on the basis of price and delivery time. Growth of construction in Iran has been so rapid that product availability was the main purchase criteria during 1974-76. As demand slackened in 1976, service and spare parts availability became increasingly important to buyers. Caterpillar Tractor Company, which sells over 30% of all excavating equipment in the country, found the establishment of a spare parts warehouse essential to maintain its mar-

ket leadership, and other competing firms have followed Caterpillar's lead.

Building products and materials are normally sold through a distribution network made up of hundreds of small outlets located near centers of heavy construction activity. Distributors handling imported specialized building products and "decorator" items frequently maintain showrooms in major cities, where potential purchasers can inspect the products in specially designed displays. Quality and availability are key factors in successful sales of these products.

Newspaper advertising and personal sales calls to large construction companies are the principal promotional means used in marketing construction equipment and building products. No specialized construction trade journals exist in Iran. However, nearly a dozen separate guilds of building products manufacturers and merchants have headquarters in Tehran. New supplier firms entering the market normally employ a newspaper advertising campaign as the initial promotional vehicle and then follow up with personal calls and point-of-sale demonstrations. Construction industry trade exhibitions are held periodically at the Tehran International Fairgrounds.

Most building products are subject to import duties ranging from 5 to 75% ad valorem plus a Commercial Benefits Tax (CBT) levied on the basis of weight; the CBT on some finished items is levied on an ad valorem basis.

## COMPETITIVE POSITION OF U.S. SUPPLIERS

U.S. manufacturers of construction equipment were quick to establish themselves at the beginning of Iran's construction boom in the early 1970's, and by 1975 had established a very strong position in the market. Most of the major U.S. construction equipment suppliers have extensive sales, service and spare parts programs and have stationed sales and technical personnel in Iran. Increasing competition from foreign suppliers will make availability of parts and servicing key factors in the future.

U.S. suppliers of building products have a transportation disadvantage in Iran's highly competitive market, and best sales opportunities exist in supplying the more expensive items, such as modern plumbing fixtures, lighting fixtures and switches, as well as decorative interior and exterior trim.

Several U.S. contractors and engineering firms are very well established in Iran. U.S. firms may benefit from changes in government policy in early 1977 which placed increased reliance on the use of foreign engineering, construction and consulting firms in the implementation of large public sector projects.

# Education and Training Services

THE SHORTAGE of trained personnel has been a serious obstacle in virtually all areas of Iran's development over the past decade. Spectacular economic growth in 1973-76 and ambitious long-range plans for change in Iran have caused planners to focus more of their attention on how to transform a largely illiterate rural population into a modern industrial work force in the shortest time. Iran has invested enormous amounts of money for infrastructure development to raise the productivity of its still largely untapped resources. Most planners agree that one of Iran's least developed potential resources is its population, that the most critical investment to be made is in the expansion and upgrading of educational and training programs, and that the success of all other investments depends on success in this area.

Beyond the formal education system, a wide range of programs and activities plays an important role in the acquisition of modern technology and management capabilities needed for Iran's developing economy. New industries are being created through joint ventures, technical service contracts and other relationships with foreign firms. A growing service industry is developing including management consultants, data processing services, consulting engineers, accounting and financial services firms, and other specialists. In both the Government and private sectors of the Iranian economy, buyers look beyond the acquisition of hardware to the acquisition of new systems, technology capabilities, and skills in making purchasing decisions.

Expenditures for education and other activities aimed at acquiring needed productive, administrative and managerial skills amounted to some \$4 billion in 1976. They are expected to rise to \$7 billion by 1980. The Government's budget for educational programs alone was \$2.5 billion in 1976 and will rise to \$5 billion by 1980. Based on these amounts, an excellent and growing market in Iran exists for specialized educational equipment, software and services. At the same time, firms engaged in marketing to all sectors of the economy should be aware that the software component of their sales proposals may be as important a factor as the equipment being offered.

## STRUCTURE AND SIZE

### Principal Government Organizations

While nearly all government organizations have some training responsibilities, the following government offices have primary authority. The Ministry of Education, located in the Zil-e-Saltan Palace, Ecbatane Avenue, Tehran, is responsible for providing facilities and teachers for kindergarten through the 12th grade. The Ministry of Science and Higher Education, located at Building No. 2, Villa Avenue, Tehran, is formally responsible for the entire system of higher education, although some universities have maintained a large degree of autonomy. The Ministry of Labor, located on Eisenhower Avenue, Tehran, has responsibility for vocational and technical training at the level of higher education. The Industrial Training Board and the Professional Training Organization, located on the corner of Takhte Jamshid Avenue and Fisherabad Avenue, Tehran, are the main Ministry of Labor agencies responsible for the implementation of training projects. The Ministry of Agriculture, located at Elizabeth II Boulevard, and Vasal Shirazi intersection, Tehran, is charged with responsibility for agricultural education and training, implemented by its Agricultural Training Organization.

The independently funded Institute for Educational Planning and Research carries out research on educational programs and makes recommendations to the concerned ministries. Within the Ministry of Court, a division for evaluation of higher education and scientific research also carries on basic education research. The Imperial Council on Education, chaired by their Imperial Majesties, the Shahanshah and the Empress, sets a unified educational policy for the nation.

In addition, 54 separate interministerial councils and committees are involved in educational planning. The most important and influential of these are the Council of Educational Expansion, chaired by the Director of the Plan and Budget Organization, and the State Central Council for Universities and Higher Education, chaired by the Minister of Science and Higher Education.



## The Formal Education System

Growth of the educational systems under the Ministry of Education and the Ministry of Science and Higher Education has been rapid during the 1970's. Between 1973 and 1976 the education budget more than tripled, reaching about \$2.5 billion in the latter year (see table 1). The number of ministry-run schools also has grown rapidly; 56,343 schools existed in 1975/76 as opposed to 24,758 in 1970/71. The number of students enrolled in school grew at an average annual rate of 12% during 1974/76 (see table 2). In the 1975/76 academic year, over 7.5 million students were enrolled in schools operated by the Ministry of Education, up from 4.1 million in 1970.

The number of graduates from schools at each level also increased as indicated in the following table:

	1972/73	1973/74
Primary School Graduates	423,000	471,000
General High School Graduates	82,000	97,000
Vocational, Technical, and Teacher Training Graduates	20,000	25,000

The Ministry of Education made several changes in its program in the mid-1970's. In 1974, the Ministry began implementation of a plan which has been popularly called the "nationalization" of primary education in Iran. Based on a royal decree intended to provide compulsory education for all Iranians, the Government undertook the costs of primary education, both in public and private schools. Primary education was shortened from 6 years to 5 years. Following elementary school, a new

**Table 1.—Iran: Education Budgets 1973/76**  
(millions of U.S. dollars)

Type of School	1973	1974	1975	1976
Kindergarten	2.0	9.3	26.2	55.7
Primary	271.5	375.0	479.2	685.9
Guidance Schools	78.0	140.9	206.8	291.5
High School	82.3	138.2	173.5	223.9
Technical/Vocational Training	74.9	139.1	198.9	240.1
Universities	142.6	211.2	296.8	365.6
Teacher Training	42.1	74.7	119.8	225.0
All Others	89.4	193.6	301.9	391.7
Total	762.8	1,282.0	1,803.1	2,479.4

Source: Official Government Budget

3-year program called the "guidance school" has been instituted for students who aim at attending high school. Another program, called "preliminary vocational education," is primarily designed to provide training in skills needed by students who will live in rural areas. Students who continue after guidance school go either into a 2-year technical training program or a 2-year general education program. The final year of secondary school is then spent in a 1-year "preparatory for employment" or "preparatory for college" course of studies (see figure 1).

### Kindergarten School

In 1970, 19,000 children were enrolled in kindergarten facilities throughout the country. Most kindergartens in the late 1960's were privately owned and operated. By 1975, the Ministry of Education had enrolled over 175,000 students in 1,067 kindergarten facilities located mostly in urban areas. Less than \$2 million was allocated for the operation of kindergartens in Iran in 1973, while the 1976/77 educational budget allocated over 2.2% of the national education budget or \$55.7 million for the operation of these schools.

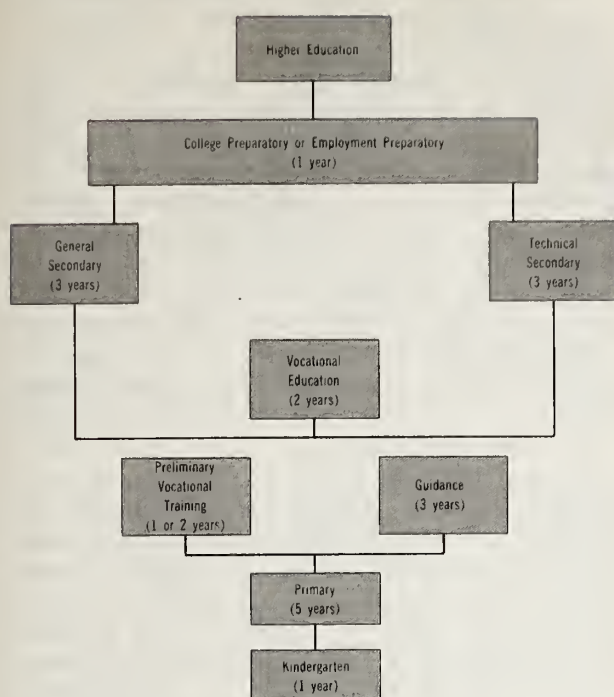
**Table 2.—Iran: Growth of Educational Facilities and Students, 1970–1975**

	1970/71	1973/74	1974/75	1975/76	1979/80
<b>Student Enrollment</b>					
Kindergartens	19,300	40,990	88,850	175,424	500,000
Primary Schools	3,002,000	3,646,000	4,118,000	4,468,298	6,000,000
Guidance Schools	—	906,350	1,151,000	1,283,661	1,750,000
General Schools	536,000	770,000	793,000	883,723	1,220,000
Vocational Schools	52,700	86,000	147,000	187,588	600,000
Teacher Training Schools	13,500	31,000	37,500	45,185	110,000
Universities and Independent Colleges	74,708	123,114	135,354	148,000	195,000
Others <sup>1</sup>	481,000	525,000	553,000	578,000	664,000
Total Enrollment	4,179,208	6,128,454	7,023,704	7,769,880	11,039,000
<b>Number of Facilities</b>					
Kindergartens	349	607	981	1,067	3,030
Primary Schools	15,202	33,800	35,790	38,000	50,000
Guidance Schools	—	3,700	3,938	4,250	5,800
General Schools	2,509	2,215	2,134	2,288	3,160
Vocational Schools	185	383	552	623	2,000
Teacher Training Schools	90	114	127	153	375
Universities and Independent Colleges	73	97	105	112	147
Others <sup>1</sup>	6,350	9,500	9,590	9,850	11,050
Total School Facilities	24,758	50,416	53,217	56,343	75,562

<sup>1</sup> Includes over 9,000 Literacy Corps Schools and other specialized schools.

Source: Ministry of Education, Ministry of Science and Higher Education, and trade estimates.

Figure 1  
Iran: Formal Education System, 1976



Source: Ministry of Education

## Primary School Education

The "nationalization" of the Iranian school system decreed in 1974 was directed mainly at primary school education. This was done not only to ensure educational opportunities for all Iranian school-age children, but also to bring education to Iran on a truly national scale. Primary educational facilities had an enrollment of almost 4.5 million students in the 1975/76 school year. A total of 471,176 students completed primary school at the end of the 1973-74 school year, the latest year for which statistics are available. The Ministry of Education budget allocated over \$685 million for primary education; more than 27% of the total Ministry budget. By 1980, enrollment in primary schools will pass the 6 million mark and 93,000 new primary schools will be needed if the ratio of students per school remains at 1975 levels.

## Guidance Schools

The 3-year guidance school program was begun in 1973, and by the 1975/76 school year 1.28 million students were attending these schools. The guidance school provides an early aptitude screening for students; those who show an aptitude for vocational subjects are directed into technical training while those who show academic aptitude are sent to college preparatory programs.

## Secondary Education

The Ministry of Education's secondary education program has been divided into two distinct types of training: general education and vocational education. Students enter one or the other of these areas after evaluation of their aptitude during the guidance school program.

**General High Schools.**—In 1975/76 2,288 general high schools had an enrollment of 883,723 students. A total of 96,706 students graduated from general high schools at the end of the 1973/74 school year, the latest year for which statistics were available. During the first year a student enters one of two areas of study: mathematics and experimental sciences or humanities. During the next 2 years, he chooses one of four specialized fields: physics and mathematics, experimental science, cultural studies, or social economy.

**Vocational High Schools.**—In 1975/76 623 vocational schools had 187,588 students. A total of 24,613 students graduated from vocational high schools in 1973/74, the latest year for which statistics were available. The curriculum of the vocational schools is divided into three general subject areas: industrial studies, services, and rural professions. Each general subject area is further divided into several specific subject areas, and these are further divided into specializations. For example, the general subject area of services is divided into five specific subject areas: health services, technical services, artistic services, group services, and administrative/commercial services. Each specific subject area, such as administrative/commercial services, is further broken down into a number of specializations; in this case, commercial studies, secretarial studies, accounting, and transportation.

## Teacher Training

Iran has a critical need to develop its teacher training capability to keep up with the overall plans for the expansion of the educational system. Major steps have been taken to train qualified teachers. In 1970 13,500 student teachers were enrolled in 90 training centers. By 1975, the number of student teachers had risen to 45,185 in 153 centers. In 1975, 14 centers existed to train kindergarten teachers, 120 centers to train primary school teachers, 24 centers to train guidance school teachers, 1 center for vocational teachers, and 4 special centers, 1 each to train teachers for the blind, deaf, advanced students, and religious studies.

## Higher Education

The Ministry of Science and Higher Education is responsible for overall planning for Iran's colleges



**Table 3.—Iran: Distribution of Students in Institutes of Higher Education, 1972/73, 1974/75, and Projected for 1977/78**

Field of Study	1972/73	1974/75	1977/78
Humanities .....	15,361	23,431	19,000
Teacher Training and Educational Science .....	23,394	41,812 <sup>1</sup>	37,300
Fine Arts .....	3,200	4,414	5,300
Law .....	2,300	3,210	3,400
Social Sciences .....	24,870	30,991	42,000
Mathematics and Natural Sciences ..	11,759	21,966	20,900
Engineering .....	18,116	25,868	34,800
Medicine .....	11,300	14,961	19,000
Agriculture .....	4,700	6,466	8,300
Total .....	115,000	173,119	190,000

<sup>1</sup> The statistics for teacher training and educational science includes 4,013 students studying the field at institutes of higher education and 37,799 students studying teacher training at secondary-level vocational schools. A similar breakdown is not available for the 1972/73 and 1977/78 school years.

Source: Fifth National Development Plan, An Analysis of U.S.-Iranian Cooperation in Higher Education, Overseas Liaison Committee, American Council on Education, Nov. 1976.

and universities. In total, the higher education system has 72 institutions offering bachelor's degrees or above, 15 of which were major universities. There are 55 institutions with programs leading to 2-year associate degrees.<sup>1</sup> In the 1974/75 academic year, 173,119 students were enrolled in institutions of higher education, 37,779 of these in teacher training programs at the secondary level. Majority of students were enrolled in the fields of social sciences, engineering, humanities, and mathematics and natural sciences (see table 3). In 1974, 30,560 students graduated from Iran's colleges and universities; of this number there were 5,900 engineering graduates, 2,500 medical school graduates, 1,260 agricultural graduates, and 4,500 graduates in the field of natural sciences and mathematics. During the 1976/77 school year, some 35,000 new students were accepted in Iran's university system. Tehran University is the largest university in Iran with 17 faculties and 35 affiliated institutes enrolling over 20,000 students. The 1975 budget for this university was \$84 million.

One of the goals of Iran's Fifth Plan has been to increase the number of universities in the country. In 1975, the Agriculture College in Rezaiyeh completed expansion to agricultural university status with some 1,500 students to be enrolled annually. Bu-Ali University in Hamadan, where over \$30 million has already been spent on construction of the main buildings, also began accepting students for the 1976/77 school year.

Many of Iran's universities have agreements with foreign universities. The working relationship between The University of Pennsylvania and Pahlavi University in Shiraz was one of the first links between an Iranian and a U.S. institution of higher

learning, and constituted a model for many subsequent contracts between universities. The first assistance to the Faculty of Medicine at Pahlavi was provided under a U.S. Agency for International Development contract signed in 1962. In 1965 assistance to the medical school was phased out, but the contract was extended to include other areas: administration, archeology, biology, electrical engineering, English as a second language, history, library science, and philosophy, recruiting of faculty members for Pahlavi, and fellowship support for Pahlavi faculty members to study at Pennsylvania. A direct contract between Pahlavi and Pennsylvania universities, funded by Iranian sources, was concluded. Under this contract, Pennsylvania subsequently recruited some 400 faculty members, both Iranian and non-Iranian.

In May 1968 there was an exchange of letters between the U.S. Ambassador to Iran and the Iranian Prime Minister with the objective of intensifying "cooperation between the scientists involved in government agencies and in academic or other institutions of (the) two countries." This exchange set the groundwork for the various links between the University of Tehran and U.S. institutions, as well as such links with other Iranian universities which were to follow.

**Vocational/Technical Colleges.**—The number of other types of colleges under the jurisdiction of the Ministry of Science and Higher Education increased from 174 to 600 between 1970 and 1976. Most of these are 2-year post-high school colleges which offer general technical courses such as electric/electronic repairs, carpentry, machine operation, etc. In 1975 these technical vocational colleges had a total enrollment of 172,000 students and employed over 7,000 teachers and administrative personnel.

## Other Programs

**Adult Literacy Classes.**—The campaign against illiteracy was inaugurated in 1973 and is a fundamental objective of social reforms that make up the "Revolution of the Shah and the People." Since that time, over 2.2 million adults and children have learned to read and write through special training, and in 1976 some 254,000 people were enrolled in the program. The literacy rate for persons 10 years and over in 1975 was estimated at 35%, and it was further estimated to be growing at 3% per year, thus indicating a total growth of 50.3% by 1980. The Government allocated \$35 million for the training of all illiterate urban adults in 1976. The Ministry of Labor and the Ministry of War also are involved in literacy training, and approximately

<sup>1</sup> A list of Iranian institutions of higher education is at the end of this chapter.

150,000 soldiers and industrial workers are trained each year under their programs.

**Educational Television.**—Use of television for educational purposes began in 1967 under the auspices of the Ministry of Education. The Educational Television Division (ETV) of the National Iranian Radio and Television Organization was formed in 1973, and it launched an effort to provide educational TV nationwide. By 1976, ETV had broadcasts of 6 hours a day, 5 days a week, with programming for grades six through eight of the public school system. Geographic coverage was approximately 75% of the country, the same as for the television network as a whole. Immediate plans included addition of programming for the first and second grades.

ETV is divided into three components:

1. A Production Department which is responsible for the development and production of audio-visual materials related to grades one through six.
2. A Graphics Department which is responsible for all graphics and set designs used in the production of educational programs at the facility.
3. A Special Projects Department which in 1976 had the following projects underway:
  - a. An audio-visual formatting for first grade texts. Using materials from Borg-Warner Corp. and Hoffman Electronics Corp. (both U.S.), this project is packaging the first grade reading text on records and filmstrips.
  - b. Industrial Development Institute: This project is designed to teach Iranian school teachers and administrators about audio/visual material to enable them to better use the new equipment that will be introduced into the schools in the next few years.
  - c. Resource Learning Centers. ETV plans to establish 25 of these centers which will serve school districts as lending libraries of audio/visual materials throughout the country by 1983.

### **On-the-Job Vocational Training**

In addition to the 2,228 technical schools run by the Ministry of Education, the Ministry of Labor and Social Affairs in 1976 had extensive vocational training programs which were directed by two of the Ministry's agencies—the Professional Training Organization (PTO) and the Industrial Training Board (ITB). The Ministry of Labor trained 60,000 workers during 1970–75.

**PTO.**—In 1976, PTO was operating seven vocational training centers: three in Tehran and one

each in the cities of Esfahan, Karaj, Tabriz, and Mashhad. Twelve additional centers were under construction and scheduled for completion during 1977. PTO planned to have 37 centers in operation by 1980. The PTO centers offer training in automotive mechanics and diesel repair, electronics, electro-mechanics, air-conditioning, metalworking, and welding.

**ITB.**—In late 1976, ITB was operating 3 large centers, 3 small centers, and 37 mobile training vehicles. The three large centers offer training in a wide range of industrial skills, and each provides additional specialized training in a particular field, one in textiles, one in automechanics, and the third in construction. ITB planned to build six more large centers by the end of the Fifth Plan. In all, ITB centers offer training in 50 different industrial skills. ITB also monitored training programs run by individual companies to maintain established standards of skill training.

ITB programs are financed by a 2% worker payroll tax assessed on all industrial firms in the country. Companies that offer their own approved training are allowed to credit their cost toward this tax.

**The Imperial Organization for Social Service (IOSS).**—IOSS is involved in several types of professional and vocational training. In 1976, IOSS was operating a nurses' training school, two auxiliary nurses' training schools, and three industrial vocational training centers. The Reza Pahlavi Vocational School in Tehran which had a student body of over 1,000 studying 14 different skills in 1976, was the first of the IOSS vocational schools to be set up. The school was developed by Austrian experts under an agreement between the Iranian Government and the Austrian Government.

In 1976, two other schools were in operation. The IOSS Vocational School in Tabriz, set up under agreement with West Germany, offers instruction in electronics and utility services installation. The center in Esfahan has instruction in automechanics, electronics, machine tools, tool manufacturing and utilities services installation. Students in these centers receive training free of charge. The IOSS plans to have 10 vocational training centers in operation by 1982; four of these are scheduled to start before 1979. Each center will be set up and run for a period by a different country under government-to-government agreements.

### **Agricultural Training**

The Agricultural Training Organization (ATO), an agency of the Ministry of Agriculture and Natural Resources, operates 11 training centers throughout Iran. These centers teach vocational agriculture



courses at the high school level in animal husbandry, poultry, and field crops, and in addition they have shorter training programs to improve methods of working farmers. ATO plans to establish three more centers by 1978 and an additional 10 centers by 1983.

## **Management Training**

Interest in management training has quickened, and numerous organizations offer such programs. Three schools offer master of business administration (MBA) programs. They are: (1) The College of Public and Business Administration of Tehran University; (2) the Industrial Management Institute (IMI), operated by the government investment and holding company, the Industrial Development and Renovation Organization (IDRO); and (3) the Iran Center for Management Studies (ICMS). The University of Tehran's College of Public and Business Administration recently added a doctor of business administration curriculum. IMI, which recruits many of its faculty members from Europe and the United States, also offers a 2-year half-time course leading to the MBA degree. ICMS, which enrolled its first class in 1972, has an 11-month MBA program and runs numerous specialized short-term management development courses each year. The curriculum of ICMS is modeled on that of the Harvard Business School, with which ICMS maintains a close relationship.

The International Management School (IMS) was set up as a result of an agreement reached in May 1976 between the Iran Chamber of Commerce, Industries and Mines and the French National Foundation for Management Education. The school began operations in October 1976 with 50 students enrolled in its bachelor's program. The first 2 years of studies are in Iran in the English language; the third year at the French National Foundation for Management Education includes practical work in French companies, and the fourth year in Iran. Fourth year courses will be offered in Persian, English, and French. IMS plans to add an MBA program and short-term executive programs at a later date.

Kepner-Tregoe Inc. (U.S.) opened a subsidiary office in Tehran in 1975, and offers courses in decisionmaking and problem solving in the Persian language as well as English. Westinghouse Learning Corporation, division of Westinghouse Electric Corp. (U.S.) has offered courses in Iran, primarily for companies affiliated with other divisions of Westinghouse, but also for participants from other firms. In early 1977, Advanced Management Research International Inc., working in cooperation with the Kayhan Group of Newspapers, began offering management seminars.

The National Iranian Oil Company (NIOC) has had a greater impact on upgrading management practices than any other organization in Iran. NIOC sends its employees abroad for training and also provides a wide variety of courses at its own training centers and at the offices of foreign suppliers. Managers who were trained by NIOC over the years hold key positions in organizations in all areas of Iranian industry and government.

## **Financial and Bank Management Training**

Most banks have their own training programs. Specialized financial and bank management training is available through several institutions including the Iran Banking Science Institute (IBSI). Large international banks operating through joint ventures and representative offices in Iran frequently send their personnel overseas to acquire specialized training.

**Bank Melli.**—The state-owned Bank Melli is the largest commercial bank in the country. In 1975/76 it had 177 employees enrolled at IBSI and other universities. In 1976 Bank Melli had 564 employees studying in internal training programs; 277 employees were sent to special courses in banking subjects, while 6 were sent abroad to attend banking seminars. Another 20 were sent abroad for specialized bank training, and 50 were sent to language institutes for instruction.

**Central Bank of Iran.**—The Central Bank of Iran (Bank Markazi Iran) sponsors a 5-week banking management development program to train upper middle-level bank managers.

**IBSI.**—IBSI was established in 1963 by Bank Melli, Bank Sepah and the Central Bank of Iran. It accepts students who hold high school diplomas in mathematics, biology, commerce, accounting, and banking subjects. IBSI offers a 4-year program leading to a bachelor of science (B.S.) degree, and in September 1977, it plans to offer master's programs in accounting, economics, management, and banking. In the mid-1970's 500 to 600 students graduated from the undergraduate program each year. Enrollment at the institute is about 2,000.

Besides the B.S. program, IBSI also offers classes for bank personnel holding high school diplomas. These are 80- to 120-hour courses to improve performance of staff in subscribing banks. About 300 to 400 students study bank management, accounting, credit, general banking, exchange, and exchange regulations in each session, four of which had been run by 1977.

**Business Organizations.**—A large number of business organizations also operate training programs either for their own staff or in connection with providing equipment and other services to Iranian



clients. For instance, IBM Iran, a branch office of IBM World Trade Corp. maintains a training center in Tehran. In addition to training which is carried out for customers' staff, IBM maintains training programs for its own personnel in data processing systems engineering, and sales and marketing.

Arj Corporation, producing consumer durables under license from various European and U.S. manufacturers, has training for its employees at managerial, administrative, and worker levels. Arj uses the services of a number of training suppliers such as the Iran-America Society and Language House for language training, the Ministry of Labor for safety training, Pazand Accounting Institute and the Free University of Iran for training in accounting and finance. Arj trains its labor through use of the Industrial Training Board and also has its own internal training instructors. Each year Arj sends managers abroad to Great Britain, Italy and the United States for training. In 1976 six people were sent abroad. Arj's training budget in 1976 was approximately \$200,000.

## Transfer of Technology

The Government has followed a policy of obtaining new capabilities and expertise in technology and management for the public sector through various types of association with foreign organizations. The private sector also has been encouraged to seek similar relationships. The most common arrangements for technology transfer are:

- (1) Through government-to-government technical assistance agreements and arrangements with universities or specialized institutions.

- (2) Through direct contract, on a project basis, with foreign engineering consulting or producing firms with specialized industrial or other expertise.

- (3) Through joint venture projects; and

- (4) Through Iranian investment abroad (examples are: Iran's purchase of a \$125 million share of Krupp (West Germany) to gain access to its capability in heavy industry. In 1976 agreements were reached with Krupp for the development of a major heavy industry complex near Esfahan and Iran's attempt to purchase part of the Italian Oil Company AGIP to acquire further capability in international marketing of oil products.)

A number of universities in the United States have associations with Iranian universities for faculty and student exchange, research, curricula development, and teaching, while Iranian Government departments also have arrangements with U.S. academic institutions for training, development of specialized programs and other consulting services.<sup>2</sup> Many institutions thus engaged in Iran are heavily involved in

training programs, and agreements often specify the training to be undertaken. In other projects formal training may not be specified, but the foreign firm's responsibilities frequently include the development of local capabilities through the setting up of managerial administrative and production systems and informal on-the-job training. These foreign firms are seen by the Government as performing a vital educational function.

Numerous foreign firms provide training services as part of their association with domestic companies or government organizations. Major U.S. contractors engaged in such arrangements are Westinghouse Electric Corporation and Hughes Aircraft Co., which provide management and training services to Iran Electronics Industries; Bell Helicopter International, a division of Textron, Inc., providing similar services to Bell Helicopter, Iran; Northrop Corporation with Iran Aircraft Industries; The Anaconda Co. with Sarcheshmeh Copper Mines; and Time Inc. which provides services to the new printing and publishing company Sherkate Chap Va Nashr-e Danesh Now. The primary purpose of these contracts, in most cases, is the transfer of technological and managerial know-how.

The number and range of domestic firms engaged in consulting and technical services in Iran also grew rapidly during 1972-76. In 1972, 77 firms were listed with the Office of Consultants and Experts' Affairs of the Plan and Budget Organization. This number had risen to 172 firms in 1976. While this list serves primarily as a form of regulating consulting engineering firms engaged in government contracts, the increase in the listing is indicative of the growth of consulting and technical services as a whole.

An estimated 76 foreign firms are engaged in the consulting engineering field and 220 firms are involved in other forms of consulting. A large number of equipment suppliers, not included in the above figures, provide engineering, consulting and technical services related to their specific line of equipment. Each industry report in this publication discusses the role of consultants and engineers, and identifies representative firms active in the industry.

Accounting and financial services represent the largest percentage of activity in the management consulting field, followed by data processing and systems, feasibility studies and facilities planning, industrial engineering, market research, personnel systems and administration, and agricultural management (see table 4). A number of firms specialize in each of these areas, but among the most successful firms in Iran are larger organizations which offer a variety of management consulting services. The two largest organizations are the Industrial Management Institute and Coopers & Lybrand Iran.

<sup>2</sup> See lists at end of chapter.



**Table 4.—Iran: Representative Consulting Firms**

**Marketing**

Admark  
Denjon Market Research Consultants  
Interpub, Iran Market Research Organization  
Marketing & Sales Management Ltd.  
Marketing Services and Research Associates  
National Institute of Psychology

**Management Accounting and Finance**

Amin & Co. (Arthur Anderson & Company)  
Arthur Young & Co.  
Coopers & Lybrand Management Consultants Ltd.  
Peat, Marwick, Mitchell & Co.  
Price Waterhouse  
Whinney Murray & Co.

**General Management**

Coopers & Lybrand Management Consultants Ltd.  
Fizibel  
Industrial Management Institute  
Iran International Consultants Ltd.  
Yekon Economic Consultants

**Data Processing and Systems**

Computer Science Corporation  
Computer Services Co.  
General Systems Iran  
Information Systems Iran (ISIRAN)  
International Training Consultants  
Systems Development Corp.  
V. Jat. Co.

**Agriculture and Agribusiness Management**

Agricultural Services Company  
Agronomics Co. Ltd.  
F A C E  
Farm Chemicals Ltd.  
Hawaiian Agronomics Co.  
IBEC Iran  
Khadamat Iran Zamin Co.  
Penacog Ltd.

**Professional Services**

ABS Worldwide Technical Services  
Hillcrest Anstalt  
Westberg & Associates

Source: Trade interviews.

The Industrial Management Institute (IMI) was established by the Ministry of Economy in 1962, and in 1967 it was made a subsidiary organization of the Industrial Development and Renovation Organization (IDRO), the Government's investment and holding company. IMI provides services in management research, education (see Management Training above) and consulting. In 1975, IMI had 92 professional consultants on its staff. Its clients were mostly government organizations and companies; the Government is believed to account for 90% of IMI's billings. IMI has a strong commitment to the training and development of its professional staff; normally 10% of its staff is in training programs at any given time.

Coopers & Lybrand Iran Ltd. (C&L) was formed in 1958 by Coopers & Lybrand, the U.K.-based international consulting firm, to provide accounting and auditing services. C&L became involved in other forms of consulting work and in 1972 formed a separate company, Coopers & Lybrand Management

Consultants Ltd., which by 1976 had a staff of more than 80 professionals. The management consulting services of C&L in Iran grew within 3 years of the company's formation to the rank of third in the U.K. company's worldwide operations.

A number of domestic firms engage in specialized consulting services. Agricultural Services Company, founded in 1977, provides a broad range of agricultural services including feasibility studies and investment analysis, management consulting for food companies, market and environmental analysis and planning for Iranian and foreign agribusiness companies. It focuses its activities on the general and technical management of productive and processing ventures. Firms engaged in market and industrial research, feasibility studies, and providing services to foreign firms entering the Iranian market include Admark, Marketing Services and Research Associates, Interpub, Iran Market Research Organization, Asia Development Organization, the National Institute of Psychology, and Fizibel. Fizibel, formed in 1975, specializes in the evaluation, planning and co-ordination of industrial and development projects as well as management services.

**Service Contracts for Management, Technology and Training.**—In the early 1970's, many specialized foreign firms operated in Iran as prime contractors in major industrial projects or to provide specific services in the areas of management, technology or training. It is estimated that by 1976 there were more than 100 foreign firms in Iran engaged in specific projects. Many of these firms had registered domestic subsidiary offices for the duration of their contract. While the nature of these contracts varies greatly, a major objective is almost always the transfer of technology and managerial systems, and prime contractors' responsibilities often include training, start-up and operation of projects for an initial stage.

**Joint Ventures.**—Joint venture agreements also normally include training and management responsibilities for the foreign partners. In addition to investment, a principal motivation of the Iranian Government or private partner in a joint venture arrangement is the acquisition of technological and management expertise, and this consideration may be far more important than the equity provided by the foreign partner.

## TRENDS, PROGRAMS AND PROJECTS

After 1970, Iran's educational and training systems grew rapidly because of the requirements of the country's growing and changing economy. From 1970 to 1975 the Government made major commitments to further industrialization, often in fields

relatively underdeveloped, and the manpower requirements of these commitments have required a corresponding buildup of the educational and training capability of the nation.

The society of Iran during the mid-1970's, in contrast to 10 years ago, offers much more opportunity for individual mobility. Part of the growth of educational and training activity is a result of the increased demand by individuals who see the acquisition of new skills as a way to improve their own social and economic standing. The rising demand for educational services has caused increased pressure on the educational system, particularly at the upper levels where facilities are limited. In 1976, 300,000 students took the college entrance examination; however, Iran's colleges and universities had places for only 36,000 entering freshmen that year.

In response to this increasing demand and the limited number of places in the nation's universities, numerous commercial schools have appeared and many students go abroad for advanced education and training. In 1976, there were an estimated 20,000 Iranian students studying in the United States, a greater number than from any other foreign nation.

The activities of the numerous organizations involved in education and training programs expanded greatly in the mid-1970's. The budget for primary, secondary, higher education, vocational and adult educational programs run by government ministries totaled \$370 million in 1970; by 1973 the budget had grown to over \$761 million and for the 1976/77 school year it was \$2.5 billion; the budget is expected to reach \$5 billion by 1980. In addition many other government organizations have increased funds allotted for various specialized training programs (see table 5).

The formal education system, as measured by the number of students enrolled, grew an average of 12% annually during 1973-75. Average annual growth rates of student enrollment during this period in various levels of the educational system were: kindergarten 107%, primary school 10%, guidance school 19%, general secondary school 7%, technical schools 25%, teacher training schools 25%, higher education 10%. The Government's budget for education has not only grown enormously in real terms, but also in relation to total government expenditures, rising from 7.4% in 1974 to 8.6% in 1976. Despite a general tightening of the Government's budget in 1975 and 1976, increased educational allotments grew 34% between 1975 and 1976 and again 32% in 1977 over 1976.

Increasing effort has gone into making the educational system more responsive to Iran's present-day manpower requirements with major emphasis placed on technical, vocational, and managerial education.

**Table 5.—Iran: Government Budgets for Training,  
Excluding the Budget of the Ministry of Education and  
Science and Higher Education**  
(thousands of U. S. dollars)

Organization	1974	1975	1976
Advanced Training of Informatics .....	1,434	1,859	2,078
Arak Machine Tools .....	1,470	1,727	1,702
Arya National Shipping Lines .....	2,484	2,957	2,837
Baghche Ban Institute of Deaf and Blind ....	208	458	584
Civil Aviation .....	892	1,845	1,886
Civil Defense .....	431	739	284
Documentation and Registration Office .....	58	149	143
Endowment Organization .....	—	961	—
Farah Training Institute .....	2,159	3,430	2,766
Firuzgar Medical Research and Training Center .....	4,200	4,480	5,050
Gendarmerie .....	430	430	142
Imperial Aviation Club .....	3,186	4,136	4,241
Industrial Development and Renovation Organization .....	1,035	2,720	2,894
Industrial Training Board .....	8,768	12,043	12,766
Institute for Child and Mother's Care .....	453	270	720
IOSS, Training Center for Social Services ....	650	1,050	950
Iranian National Steel Mill Corp. ....	3,698	3,597	3,546
Iran Mines and Metal Smelting Co. ....	19	215	213
Iran Tractor Manufacturing Co. ....	887	1,079	1,063
Milk Industries of Iran .....	350	370	—
Ministry of Agriculture .....	8,550	10,770	8,631
Ministry of Court, Arts & Culture Training Program .....	269	1,478	1,418
Ministry of Culture and Arts .....	2,531	4,503	5,881
Ministry of Information .....	175	313	360
Ministry of Labor .....	65	145	236
Ministry of Power .....	1,228	1,516	888
Ministry of Post, Telephone and Telegraph ..	528	1,243	1,089
Ministry of Roads .....	161	547	451
Ministry of Rural Affairs .....	1,144	2,879	2,937
National Committee for Illiteracy .....	961	1,183	1,135
National Iranian Radio and Television .....	799	1,345	2,142
National Petrochemical Company .....	1,878	2,321	709
Police Headquarters .....	6,266	15,996	9,804
Professional Training Board .....	9,081	21,134	24,849
Red Lion and Sun Medical Training .....	—	266	4,255
Rural Cooperatives Companies Organization ..	2,217	2,158	2,127
Sar Cheshmeh Copper Company .....	1,464	2,957	2,127
State Railways .....	739	1,331	1,702
Sugar and Tea Organization .....	—	216	922
Tabriz Machine Tools Company .....	1,470	1,727	1,702
Tehran Municipality .....	813	1,966	3,745
Women's Organization .....	260	1,005	1,458

Source: Official Iranian Budget, Plan and Budget Organization

The Fifth National Development Plan specifically states that the educational program "is based on the assumption that the educational system should be capable of responding to Iran's progress in terms of manpower training and producing qualified scientists and technologists." The Plan calls for an average annual growth rate, as measured by the number of students enrolled, of slightly over 14%. The following average annual growth rates for different segments of the formal educational systems were envisioned by the Plan: kindergarten 90%, primary 10%, guidance school 24%, general secondary 8%, technical 40%<sup>3</sup> and higher education 8%.

<sup>3</sup> Includes all technical training carried out by various industries as well as primary school teacher training.



The Fifth Plan also enumerates several 10-year goals for education. Four major objectives were established which should be met by the end of the 10-year period, (corresponding with the end of the Sixth Development Plan in March 1983: (1) comprehensive free compulsory education for 8 years, (2) eradication of illiteracy among all economically active groups in the country, (3) a full appreciation by the entire society of national objectives and participation in social and economic activities and (4) an educational system capable of teaching all skills required by the domestic labor market with the exception of very advanced sectors of industry. The planned capacity of the educational system at the end of the Sixth Plan is projected as follows:

- 600,000 persons—centers for training skilled labor including both new manpower and in-service training of existing employees for the industrial services and agricultural sectors,
- 1,200,000 persons—centers and schools for training technicians,
- 400,000 students—universities and institutes of higher education,
- expansion of infrastructural and scientific research facilities so as to facilitate the introduction of technology in domestic industry, and solve various problems affecting the country's social and economic progress.

Early in 1977, the Ministry of Labor estimated that Iran would need an additional 1 million skilled workers by the end of the Sixth Plan. During the preceding 5 years, the Industrial Training Board had trained 60,000 workers. According to a public statement by the Minister, the Ministry of Labor would devote 80% of its efforts to meeting the demand for new skilled labor and, with the cooperation of industrialists, it would utilize mass media and foreign instructors while developing training classes in every workshop and production unit.

## PROJECTS

To implement the education and training goals of the Fifth Plan, numerous projects are underway or in the planning stages. The Ministry of Education is cooperating with the Educational Television (ETA) unit of National Iranian Radio and Television (NIRT) in the development of the nationwide educational television network. In conjunction with the satellite project (see Communications report in this Publication), three complete closed circuit television systems were purchased for Mashhad University. These are to be evaluated over a 2-year period and, if effective, will be placed in 50 primary and 3 guidance schools and then distributed nationwide. In 1976, NIRT purchased 30,000 television sets and

will purchase 200,000 sets for the ETV program during the Fifth Plan period. In 1976 ETV also had a pilot project underway to provide training in general subjects to factory workers in Yazd. ETV plans to expand the program to cover workers in other industrial centers.

ETV plans to establish 25 Learning Resource Centers throughout Iran during the period of the Fifth and Sixth Plans. The Learning Resource Centers will act as repositories for programmed instructional materials such as films, filmstrips, video and audio cassettes, and books, and they will also provide facilities for students to utilize these materials. Learning Resource Center staff will carry out curriculum development and introduce the use of media programs in schools in their districts.

The Free University of Iran, established in 1973 and scheduled to begin accepting students in February 1978, works closely with ETV. Developed on the model of a similar "Open University" program in the United Kingdom, the Free University will emphasize educational television, computer-assisted education and correspondence courses administered through 50 learning centers to be established throughout the country. In cooperation with ETV, the Free University is developing programs for the training of teachers, paramedical personnel and community development specialists.

At the beginning of 1977, several new universities were being developed. Located in Hamadan, Bu Ali Sina University will have faculties in rural development, natural science, social science, and teacher training. Bu Ali Sina had undergraduates enrolled in foreign language programs in 1976, but had not yet begun offering regular courses. Farabi University, to be located in Karaj, will admit students for the 1977/78 academic year and will have the following faculties: Dramatic Arts, Plastic Arts, Music, Fine Arts, Art Administration, Art Education, Urban Planning and Design. Gilan University was in the planning stage in early 1977 and was to be developed with the assistance of West German specialists under agreement between the Iranian Government and the West German Government. Students were scheduled to be enrolled for the 1977/78 academic year. The Reza Shah Kabir University, to be located in the province of Mazandaran, is scheduled to be a graduate and postdoctoral level university emphasizing the areas of physical and social sciences. The school was being developed under agreement reached in 1975 with Harvard University. The Southeast University, located in Sistan province, will be enrolling over 22,000 students when completed in 1977.

At the end of March 1983, the Iranian Organization for Social Services (IOSS) intends to add six more vocational training centers to the three that were in operation in 1976. Each of the centers will

be developed with foreign assistance under government-to-government agreements. The next center scheduled to start operations in 1977/78 is being developed with the assistance of Sony Corporation of Japan and will be located in Mashhad. Two more centers to be located in Kermanshah and Ahvaz are scheduled to start the following year. The remaining three centers to be established are as follows: one in Shiraz which will include a teacher training program being developed with the assistance of the Massachusetts Institute of Technology, one in Tabriz under agreement with the United Kingdom, and one in Kerman under agreement with West Germany.

The Professional Training Organization will add 37 new training centers by 1978/79 to the 7 centers that were operating in 1976. The organization estimates that each of these centers will require an investment of \$4 million.

The Industrial Training Board has a number of development projects. It plans to have 100 mobile units operating by 1978, 37 of which had been purchased in 1976.

Iran's educational and training programs have received assistance from a number of non-Iranian organizations. Under "Point Four" American assistance and later U.S. foreign aid agreements, numerous projects for Iran's educational programs were developed. In the 1950's, the Near East Foundation of the United States provided assistance for the development of agricultural teacher training at high schools and colleges. The American Friends of the Middle East has facilitated educational contacts between the United States and Iran, and has further provided advisory services under contract to Iranian organizations.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) has also been active in developing educational projects. One project, designed as a result of a UNESCO mission in 1970, received a loan from the International Bank for Reconstruction and Development. The original project involved building 52 schools of different types and sizes, including Ministry of Education Schools as well as vocational training centers, secondary agricultural schools and faculties of education. Through additional financial commitments by the Iranian Government, the project was expanded to include the comprehensive training of principals and heads of departments.

The International Labor Organization has trained Iranian instructors, training managers, and training officers at its International Center for Advanced Technical and Vocational Training in Turin, Italy. Plans are to train 1,800 such instructors during 1976-78 as part of a project to develop a National Institute for the training of instructors to be located

in Karaj. This institute is expected to turn out 1,000 technical and vocational instructors, training managers and training officers per year. The Center will also help develop instructional materials and training aids for the national training system.

## GROWTH PROSPECTS

Educational and training activities will maintain a high growth rate during 1976-80. Education and training have clearly been identified by the Government as a top priority area in developmental plans. Funds allocated for education in the Fifth Plan represented a 17-fold increase over the previous Plan (see table 6). Despite reductions in planned government expenditures in almost all segments of the economy for 1977/78, the education budget was not cut. It is expected that government expenditures for education and training will rise from \$2.7 billion in 1976 to \$5 billion in 1980. The amounts actually budgeted for education during fiscal years 1973/74 through 1977/78, totaling \$9.4 billion, exceed the Fifth Plan allocation by \$1.3 billion.

While development of education and training is viewed with greater urgency than ever before in Iran's history, it has always been given high priority in the Government's activities. For the period of the Fourth National Development Plan, the Government planned a 43% growth in the number of students enrolled in the educational system. The actual growth achieved in each segment of the system detailed in the Plan was greater than expected and reached slightly over 46%. A second major objective of the Fourth Plan was a revision of the education system to the 5-year primary, 3-year guidance, and 4-year secondary system. This revision, which required an enormous effort in retraining the nation's cadre of teachers and educational administrators, was nearly achieved by the end of the Fourth Plan, although some portions of it were not completed until the Fifth Plan Period.

*Table 6.—Iran: Planned Expenditures on Education during Iran's 4th and 5th National Development Plans (millions of U.S. dollars)*

Activity	4th Plan (1968/69- 1972/73)	5th Plan (1974/75- 1978/79)
Kindergarten .....	.1	148.1
Primary Education .....	165.9	2,192.1
Academic Guidance Courses .....	76.2	755.6
Theoretical Secondary Education .....	14.5	592.6
Comprehensive and Combined Vocational Training and Technical and Vocational Training .....	55.1	887.0
University Education .....	79.2	1,103.7
Other Educational Programs .....	70.9	2,471.1
	461.9	8,150.2

Source: Plan and Budget Organization



The quantitative development of Iran's educational and training systems has been impressive and rapid expansion will continue. However, critical problems and bottlenecks exist. The Fourth Plan set as objectives "maintaining better balance and relationship between . . . education and . . . the diversified and increasing manpower requirements of different productive, social, and cultural sectors." Similar goals were set for the Fifth Plan, and most concerned government officials agree that despite the reforms initiated during the Fourth Plan and continued and expanded during the Fifth Plan, the quality and relevance of education is far from satisfactory. Even if all educational and training goals of the Fifth Plan are fulfilled, the Government estimated that the total new manpower deficit at the end of the Plan period will exceed 720,000 (see table 7). As a result, emphasis will continue to be on these aspects of educational development during the 1976-80 period and beyond.

In 1968, the first annual conference on educational evaluation was held in the city of Ramsar on the Caspian Sea. The Shah and the Empress have given personal attention to the problems of education through the medium of these conferences and participation in other important councils on education. Most of the concern is focused on two major problems: the difficulty of redirecting the educational effort because of the inertia of the traditional system,

and the problem of educational planning in a country which is changing at such a rapid rate.

It is obvious that Iran will continue to try to build an educational and training system that can more readily accommodate rapid changes in skilled manpower requirements, and that to do this it will rely more and more on centralized planning as well as developments in the use of equipment and techniques of mass communications and media. This trend has been very pronounced during the early 1970's and will continue in the later part of the decade.

All forms of vocational and technical training are expected to expand during 1976-80. Two trends in this segment should become increasingly pronounced. Government organizations, such as the Industrial Training Board, will increase their efforts to develop new programs, set training standards and develop a centrally directed nationwide on-the-job training system. At the same time, individual industrial and service sectors will be encouraged to set up their own training centers. It is felt that industries are more sensitive to their own manpower requirements and will respond quickly to changes in supply and demand of trained labor. Iran will continue to look to its foreign business partners as a source of new technology and skills. Government leaders have emphasized that a key factor in the evaluation of investment, joint venture, and technical services contract proposals in the future will be the commitment of the participants to provide new technical and management skills.

**Table 7.—Iran: Demand and Supply of Manpower by Occupations During the Fifth Plan**  
(thousand persons)

Category	Demand <sup>1</sup>	Supply	Shortage
Architects, town planners and civil engineers .....	7.8	4.0	3.8
Electrical and electronic engineers ...	5.5	2.8	2.7
Mechanical engineers .....	6.9	4.2	2.7
Chemical, mining and metallurgical engineers .....	2.0	1.0	1.0
Other engineers .....	14.2	8.3	5.9
Senior medical personnel .....	8.5	7.2	1.3
Other medical personnel .....	35.6	14.3	21.3
Educational personnel .....	287.4	230.0	57.4
Higher educational personnel .....	22.5	21.0	1.5
Technicians .....	116.6	75.0	41.6
Other technical and vocational personnel .....	8.0	4.0	4.0
Managerial, administrative and sales personnel .....	185.0	185.0	—
Mining, drilling and extractive workers .....	23.0	15.0	8.0
Transport workers .....	41.0	41.0	—
Skilled and semiskilled industrial workers .....	520.0	230.0	290.0
Skilled construction workers .....	290.0	20.0	270.0
Unskilled workers .....	538.0	528.0	10.0
Total .....	2,112.0	1,390.8	721.2

<sup>1</sup> Demand for additional workers in each category to enter the workforce during the 1973/74-1977/78 period.

Source: Plan and Budget Organization of Iran and Fifth National Development Plan.

## CAPITAL GOODS MARKET

Sales of educational equipment and software, which totaled \$29.3 million in 1975, rose sharply from \$19.9 million in 1974, and are expected to reach \$84 million by 1980 (see table 8). Domestic manufacture of educational equipment is limited and while domestic supply is expected to grow, the major portion will continue to be purchased from abroad. However, domestic production of software such as slides, tape recordings, and other programmed materials in 1976 accounted for 80% of educational equipment and software.

### Educational Equipment

Sales of educational equipment in 1975 were estimated at \$10.9 million of which imports were \$10.6 million. There were 45 foreign suppliers of educational equipment active in the Iranian market, most of whom are represented by 22 distributors and agents located in Tehran.

There were approximately 15 U.S. suppliers of educational equipment with sales in Iran in 1975.

**Table 8.—Iran: Market for Educational Equipment and Software**  
(thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>EDUCATIONAL EQUIPMENT</b>					
Domestic Production					
Projectors .....	—	—	50	125	500
Televisions .....	30	70	140	380	600
Vocational training equipment .....	40	45	60	140	300
Total .....	70	115	250	645	1,400
Imports					
Projectors, screen and related equipment .....	205	460	570	2,775	5,700
Tape recorders, record players, and other audio equipment .....	210	440	720	2,400	4,500
Language laboratories .....	325	515	410	1,470	2,100
Video tape recorders .....	65	180	190	860	2,400
T.V. equipment, closed circuit, T.V. sets .....	50	675	1,390	3,710	2,800
Vocational training equipment includes technical models .....	1,790	2,260	7,325	8,050	11,500
Total .....	2,645	4,530	10,605	19,265	29,000
Exports					
Total Market .....	2,715	4,645	10,855	19,910	30,400
<b>EDUCATIONAL SOFTWARE</b>					
Domestic Production					
Training films .....	240	310	720	1,690	3,500
Instructional materials (includes textbooks) .....	11,500	13,800	14,550	19,750	31,000
Slides, tapes and other prepared systems .....	480	630	1,510	5,330	9,300
Total .....	12,220	14,740	16,780	26,770	43,800
Imports					
Training films .....	95	105	275	680	2,000
Instructional materials .....	180	220	630	1,250	3,500
Slides, tapes and other prepared systems .....	230	260	740	2,880	4,000
Total .....	505	585	1,645	4,810	9,500
Exports					
Total Market .....	12,725	15,325	18,425	31,580	53,300
<b>TOTAL MARKET FOR EDUCATIONAL EQUIPMENT AND SOFTWARE</b>	<b>15,440</b>	<b>19,970</b>	<b>29,280</b>	<b>51,490</b>	<b>83,700</b>

<sup>1</sup> Estimated.

Source: United Nations, Organization for Economic Cooperation and Development, Supplier Country and Official Iranian Trade Statistics; Estimates based on Trade Interviews.

Most U.S. suppliers shipped directly from their manufacturing locations in the United States. Hoffman Electronics Inc., however, subcontracted the manufacture of the equipment it sold in Iran to Hitachi Ltd. (Japan) and supplied from that source. U.S. suppliers have difficulty competing on price with European or Japanese products and for that reason the U.S. supplier market share has slipped, amounting to 8% of sales in 1975.

**Projectors.**—Sales of projectors used for educational purposes in 1975 totaled \$620,000. Sales of projectors are expected to grow rapidly, reaching \$2.9 million in 1976 and \$6.2 million in 1980. Eleven foreign suppliers and one local supplier of projectors are commonly used for educational purposes. The leading U. S. suppliers of projectors are Fairchild Camera & Instrument Corp., Eastman Kodak Co., and Technicolor, Inc. Buhl Projector Co., a division of Bergen Laboratories (U.S.), supplies overhead projectors. Hoffman Electronics Inc. supplies a programmed projector with audio capability which is manufactured by Hitachi. Cue-See machines, which are programmed and have audio facilities, are supplied by Charles Beseler Co. (U.S.), while Minnesota Mining & Manufacturing Co. (3M) (U.S.) has supplied a limited number of sound-on-

slide machines. Uher Werke (West Germany) is also a successful supplier of audio-visual equipment.

**Television.**—Sales of televisions and television equipment used for educational purposes in 1975 totaled \$1.5 million with only \$140,000 being provided by local suppliers. Sales are expected to grow to over \$4 million in 1976 and to reach \$5.8 million in 1978. Sales of television sets, however, will peak during 1977/78 and decline to \$3.4 million in 1980.

The leading suppliers of televisions to Iran during the mid-1970's were Japanese companies, particularly National, which has supplied closed-circuit equipment for the ETV project in Mashhad, and Sony Corp., which has supplied equipment to Iranian government and private organizations. U.K. suppliers had little success in Iran until 1976 when the Rank Organization Ltd. won a contract to supply 30,000 television sets to National Iranian Radio and Television. U.S. suppliers have not been successful in the market for televisions and TV equipment.

**Vocational Training Equipment.**—Sales of vocational training equipment in 1975 totaled \$7.4 million. A limited amount of vocational training equipment, such as electrical demonstration boards, is locally fabricated, but the vast majority of such



equipment sold is imported. Sales of this equipment are expected to rise to \$8.2 million in 1976 and \$11.8 million in 1980.

West German firms are the most consistently successful suppliers of vocational training equipment. However, due to trade agreements, shares in the vocational training equipment market have shifted drastically among supplier nations. For instance, in 1973, Canadian suppliers accounted for 45% of the market for this equipment; in 1974, French suppliers held 40% of the market; and in 1975, equipment from Belgium and Luxembourg accounted for 60% of the market. In each of these years, however, the Federal Republic of Germany consistently held 15% of the market and was clearly the second strongest supplier nation. In 1975, a significant portion of the equipment shipped from Belgium and Luxembourg was West German in origin. The two leading suppliers of vocational training equipment represented in Iran are Siemens AG. and Wagale, both of West Germany.

**Tape Recorders, Record Players and Other Audio Equipment.**—Sales of various types of audio equipment used for educational purposes were \$720,000 in 1975. Sales are expected to grow to \$2.4 million in 1976 and \$4.5 million in 1980. Japanese suppliers accounted for over 80% of the sales of this category of equipment in 1975. The leading Japanese supplier firms are: National Company, Hitachi Ltd., Sony Corporation, and Akai Electric Co. The U. S. share of this market is estimated at 8% and the leading U. S. supplier is Ampex Corp. Philips N.V. (Netherlands) and Tandberg (Norway) also are represented and have sold equipment for educational purposes.

**Video Tape Recorders.**—The market for video tape recorders in 1976 was limited, with Sony clearly the leading supplier. It is expected that video tape recorders will find an increasingly good market in Iran and that Japanese suppliers will continue to hold the largest market share.

**Domestic Manufacturing.**—Domestic manufacture of equipment for education has been limited, but is expected to grow during 1976–80. Part of this growth will be through the efforts of Sanaye Amouzeshi, a company established by the Ministry of Education, which has already launched efforts to boost local manufacture of equipment for educational use. As part of this effort, Sanaye Amouzeshi established a factory to produce projectors which had an output of 500 units in 1976. It is also expected that as supply and demand for locally produced television sets equalizes in the late 1970's, an increased amount of local production will be for educational rather than consumer use. It is also expected that Iran will produce more vocational training equipment, partic-

ularly technical models of industrial, automotive, and consumer equipment. Total sales of domestically produced educational equipment are expected to reach \$1.5 million by 1980.

## Software and Instructional Materials

The total market for educational software in 1975 was \$18.4 million. Only \$1.6 million was supplied by foreign firms, while \$16.8 million was supplied by local producers or local firms which adapted foreign imported programs for domestic use. Sales of educational software are expected to grow rapidly between 1976 and 1980, reaching \$53.3 million in 1980.

U.S. suppliers of software accounted for approximately 25% of imports in 1975. The United States has had a long history of involvement in educational programs in Iran, and is considered to be a leader particularly in technical and vocational training. Many of Iran's leading educators received their training in the United States and prefer U.S. educational materials.

Of the estimated 50 foreign suppliers of films, film strips, and other forms of programmed educational materials, U. S. firms were the leaders in 1976. Hoffman Electronics Company (U.S.) has a project with a reported value of \$680,000 to put first and second grade text books on slides for National Iranian Radio and Television (NIRT). "Sesame Street" is supplied to NIRT by Children's Television Workshop Inc. (U.S.), and "Big Blue Marble" is supplied by International Telephone & Telegraph Corp. (U.S.). The leading U. S. suppliers of programmed films and filmstrips are American Polarizer and Walter Reed, the latter for medical and hospital training films. Suppliers from the United Kingdom are the Rank Corporation Ltd. and Macmillan Limited. West German suppliers are Hagmann and Westerman. Armand Kolan (France) also supplies films and slides. The United Nations International Labor Organization supplied programmed instructional materials and educational films and filmstrips to the Ministry of Labor. Kepner-Tregoe, Iran, a subsidiary of the Kepner-Tregoe Inc. (U.S.), provides programmed materials and instruction for managerial and worker level decisionmaking and problem-solving.

**Domestic Manufacturing.**—Domestic producers of software will continue to account for the major portion of sales. During the first half of the 1970's, a large number of new firms began development, adaptation, and production of films, filmstrips, and other types of programmed educational materials. It is estimated that there were 15 domestic firms supplying educational software in 1976. The number of such firms will undoubtedly rise during 1976–80



and, in addition, government organizations with primary responsibility in the areas of education and training will also expand their capacity to produce materials for their own use. Sanaye Amouzeschi established a subsidiary company in 1977, The Iran Educational Software Production Company, which produces filmstrips, maps, charts, and transparencies. This company works under license of Westerman, GmbH (West Germany).

### **Training and Management Services**

Iran spent an estimated \$4 billion in 1976 on education and the acquisition of related technology. Total spending in this area may rise as high as \$7 billion by 1980. In addition to the budget for education, training facilities, equipment, software, and services, these expenditures include a wide array of arrangements for technology transfer such as consulting, licensing of technological processes, joint ventures, and service contracts which have been employed. Services for education and training were in greater demand during 1974-76, and this demand is expected to continue growing up to 1980.

U.S. firms have been most successful in the areas of consulting and service contracts. The United States is looked to as a leader in the development of modern technology and management techniques, and U.S. firms are frequently sought out to develop large new projects. In the area of heavy industrial technology, however, U.S. firms have strong competition from West Germany.

### **MARKET OPPORTUNITIES AND SERVICES**

Educational and training activities will expand rapidly through 1980 and as a result, opportunities for sales of equipment, educational materials and services will be excellent.

The Ministry of Education, National Iranian Radio and Television, other government agencies and private firms will purchase increased numbers of tape recorders and other audio-visual equipment for use in their educational training programs. The Government recognizes vocational and technical training as critical areas in the development of the country and will invest larger sums of money in related training programs during the last half of the 1970's. During 1977/78, NIRT will be equipping most of the schools in the country with television sets as part of the satellite project for nationwide television education. Most of the equipment for this project is expected to be purchased by 1978. Equipment requirements in 1980 and thereafter will mostly be for replacements as well as new installations in

areas just being reached by the rural electrification program.

Because of the rapid growth of education and training in Iran, there will be an excellent market for media producers in a wide range of fields such as computer sciences, automotive mechanics, welding, electronics, electricity, construction, etc., and also in technical and scientific fields. Audio-visual programs in the health and medical field will be vitally needed. Most of these materials will be locally produced but will be based largely on programs developed in Europe and the United States.

There will be opportunities to meet the growing demand for all types of managerial training in most Iranian organizations during 1976-80. Other types of training programs, particularly English language and other foreign language training, will be in increased demand during this period. There will be opportunities for both commercial courses and seminar-type training to which organizations can send their employees, and for programs that can be taught "in-house" in larger organizations with extensive training needs.

There will also be increasing opportunities for foreign firms with specialized capabilities to become involved as contractors to development projects or in joint ventures. These opportunities will occur in the fields of education and training as well as in the faster-growing segments of Iran's production and service industries. A specialized foreign firm is often required to demonstrate how it will bring about the transfer of "know-how" to an Iranian firm.

There have been increasing numbers of associations formed between foreign and Iranian institutions of higher education. Many agreements have also been concluded between Iranian government agencies and foreign universities. This trend is expected to continue during 1976-80.

### **MARKETING ENVIRONMENT**

#### **Buyers Universe**

Numerous government organizations are major buyers of educational equipment, materials and services, accounting for over 80% of the market. Four major government organizations purchase the majority of educational equipment and services in Iran and account for 65% of the total market.

The Ministry of Education is the largest purchaser of educational equipment. In 1975 the Ministry of Education established a company, Sanaye Amouzeschi, located on Soltanabad Avenue, Boostan 4 Street, Tehran. This company purchases hardware and software for the schools and universities under the jurisdiction of the Ministry of Education and the Ministry of Science and Higher Education. Many



of the large universities and colleges purchase directly through their own purchasing departments.

Sanaye Amouzeschi purchases equipment, furniture, and educational software from both domestic and foreign suppliers. In 1976 it purchased \$85 million worth of equipment and materials from foreign suppliers and \$14.2 million from domestic suppliers. It purchased small tractors, machinery, vocational school supplies such as wood, aluminum, and steel profiles from domestic suppliers, while audio-visual, laboratory, scientific, and sports equipment was purchased from foreign suppliers. Sanaye Amouzeschi deals directly with the foreign suppliers for routine purchases but uses international tenders for large purchases. The company prefers to purchase from suppliers which have representatives in Iran in order to guarantee that such equipment can later be readily serviced. Sanaye Amouzeschi buys the majority of its films and other instructional materials from domestic suppliers because they are made to meet Iranian requirements.

The Ministry of Labor purchases equipment for vocational schools run by the Industrial Training Board and the Professional Training Center. Much of the software used by the Ministry of Labor is supplied through the United Nations International Labor Organization and adapted by the Industrial Training Board's Central Office in Tehran.

National Iranian Radio and Television purchases the equipment needed for the national educational television project. Most individual items such as slide projectors, movie projectors, and cassette tape recorders are purchased from Iranian representatives of foreign suppliers. Large purchases are often obtained through international tender, and frequently contracts for the purchase of this equipment are drawn up for a 3- to 5-year period. The educational equipment budget for Educational Television in 1976 was \$3.7 million.

The Agricultural Training Organization, a division of the Ministry of Agriculture, purchases equipment for the 11 existing agricultural training centers and for the construction and equipping of new centers. Its equipment budget in 1976 was \$9.2 million. The agricultural centers use microscopes, movie projectors, slide projectors and TV microscopes, as well as agricultural machinery for training. All other ministries and government agencies purchase some educational equipment, and in 1976 accounted for an estimated 15% of sales.

Private commercial and industrial companies in Iran purchased an estimated 20% of educational equipment software and services in 1976. The largest users of educational equipment are companies introducing new technology under licensing agreements or through joint venture agreements. In addition there are a number of large foreign-owned sales

and service companies which purchase training equipment to train their staffs and clients' personnel.

## Marketing Factors

Most foreign-made educational equipment is supplied through Iranian firms located in Tehran, who normally handle a wide range of audio-visual equipment, slides, filmstrips, films, charts, and other programmed material. The majority of these firms are capable of translating and otherwise adapting educational programs for use in Iran. As a result, most educational software is also obtained from Iranian firms. The large purchasers, such as government agencies involved in training, have facilitated the development of local firms by contracting their services for translating and adapting materials. These firms may reproduce materials with their own facilities, or may contract to other firms, domestic or foreign.

U.S. suppliers who want to sell educational and training equipment or services in Iran should seek strong representatives with the capability of producing high quality adaptations and equipment applications to meet the specific needs of the country. Most successful suppliers of software have associated with Iranian audio-visual equipment firms to adapt and sell their products. This has often required the training of an Iranian staff but such efforts have usually been worthwhile.

Some major foreign firms which supply a wide range of equipment have established their own sales and service subsidiaries in Tehran. These suppliers also have often relied on the services of Iranian firms to make adaptations of their software programs.

Foreign consulting firms and service contractors have frequently entered the Iranian market to provide services to the Iranian subsidiary of their international clients. Some large international consulting firms first established themselves for this purpose and have since established their offices independently. Other foreign consulting firms began business in Iran as partners of local consulting firms. More recently, a large number of foreign consulting firms have recognized the potential in Iran and established their own Iranian subsidiary office.

The United States-Iran Joint Commission was formed in 1974 to provide a high-level forum for the development of cooperative activities between the two countries. The Commission meets annually, and through its committees identifies specific areas of investment, technical cooperation, and other activities in which U.S. Government and private organizations can play a role in Iranian development. The committees on economy and finance, manpower, and

science and technology in particular have discussed areas in which U.S. technology and expertise can be effectively applied. The joint commission secretariat with offices at the U.S. Department of Commerce's Bureau of International Commerce in Washington,

and the American Embassy in Tehran is knowledgeable and provides information on Iranian requirements and development projects which have been discussed within the joint commission and its committees.

***List of Iranian Government Ministries and Organizations Linked to U.S. Universities, 1976***

Iranian Government, Ministry or Organization	U.S. University	Date	Purpose and Objectives	Field
Imperial Organization for Social Services.	Johns Hopkins School of Medicine	1973	Faculty & Student Exchange with College of Health, Sciences, Tehran and Reza Pahlavi Hospital	Public Health Medicine
	Massachusetts Institute of Technology		Development of Vocational School in Shiraz	
Ministry of Court .....	University of Illinois	Pending	Proposed planning of the Pahlavi National Archives on Persian Studies	
Ministry of Energy .....	University of Southern California	Pending	To prepare a report on a master plan for higher education in Iran for Water and Power organization and management, employee education and training	
Ministry of Finance .....	American University	1976	Intensive English and M.B.A. for 15 students	Business Administration
Ministry of Health .....	Quinnipiac College	1975	Training of health personnel	
Ministry of Science and Higher Education.	University of California, Los Angeles	1976	To prepare a report on a master plan for higher education in Iran on alternatives for governance and management of higher education in terms of existing structures	
International Medical Complex (Tehran).	Columbia University —Cornell Medical School —Harvard Medical School —Univ. of Michigan	1975	To design a medical complex —organization design teaching hospital tertiary care center	
Ministry of Social Welfare .....	Columbia University —Univ. of Maryland —Univ. of W. Virginia	1974	To provide technical assistance in basic social welfare programs development; to design school of social welfare, assist in strengthening research capacity in social welfare and health	
Atomic Energy Organization .....	Massachusetts Institute of Technology	1974	Training of 2 classes of AEO-sponsored M.S. students in Nuclear Engineering	
Central Bank of Iran .....	American University	1976	Intensive English, M.B.A., Graduate students in Economics	Business Administration, Economics
Imperial Iranian Armed Forces ...	George Washington University School of Engineering	1974	Graduate training of civilian and army personnel	Computer Science, Operating Research, Management
Imperial Iranian Air Force .....	George Washington University School of Engineering	Pending	Graduate Training of Air Force Personnel	Computer Science
	American University	1976	Undergraduate Training	Computer Science
Imperial Iranian Gendarmerie ...	George Washington University School of Engineering	1975	Graduate Training of Gendarmes	Computer Science

Source: An Analysis of U.S. Iranian Cooperation in Higher Education. Overseas Liaison Committee, American Council on Education, November 1976.



*List of Iranian Institutions of Higher Education*

	Location	Founded		Location	Founded
<b>Universities</b>			<b>Institutions Leading to B.A. and Above</b>		
Aryamehi University of Technology ....	Tehran	1962	School of Rehabilitations .....	Tehran	1972
Azarabadegan University .....	Tabriz	1949	School of Nutrition and Chemistry		
Bu Ali Sina University .....	Tehran & Hamedan	1972	of Food .....	Tehran	1961
Farabi University .....	Karaj	1974	School of Cartography .....	Tehran	1964
Farah Pahlavi University .....	Tehran	1975	School of Forestry .....	Gorgan	1956
Ferdowsi University .....	Mashhad	1949	School of Statistic & Information .....	Tehran	1965
The Free University of Iran .....	Tehran	1972	School of sports .....	Tehran	1971
Guilan University .....	Tehran	1974	School of Foreign Language and Literature .....	Tehran	1964
Jundi-Shahpour University .....	Ahvaz	1954	State Management Training Center ....	Tehran	1972
Kerman University .....	Tehran & Kerman	1971	School of Translation .....	Tehran	1968
National University of Iran .....	Tehran	1957	School of Juridical and Administration Affairs .....	Qom	1969
Pahlavi University .....	Shiraz	1956	School of Programming and Uses of Computer .....	Tehran	1972
Razi University .....	Kermanshah & Illam	1974	School of Health and Science .....	Tehran	1973
Revolutionary Corps University .....	Varamin	1973	School of Science of Arak .....	Arak	1970
Reza Shah Kabir University .....	Tehran	1973	Shomal School of Management .....	Lahijan	1969
Teachers Training University .....	Tehran	1973	School of Social Services .....	Tehran	1957
University of Baluchestan .....	Tehran & Zahedan	1973	Shemiran College .....	Shemiran	1972
University of Esfahan .....	Esfahan	1950	School of Political Science and Party Affairs .....	Tehran	1971
University of Tehran .....	Tehran	1934	Technology and Science College of Iran..	Tehran	1962
<b>Institutions Leading to B.A. and Above</b>			Technical Teachers' Training Center ....	Babol	1971
Abadan Institute of Technology .....	Abadan	1938	Water Science College .....	Tehran	1965
Agriculture and Animal Husbandry			<b>Junior Colleges</b>		
College of Rezaieh .....	Rezaieh	1964	Agricultural Tools Institute of Technology .....	4 locations	
Accounting High Institute .....	Tehran	1968	Airconditioning & Computer Programming Institute .....	Tehran	1967
Banking Institute of Tehran .....	Tehran	1962	Bebehani Vocational Teachers Training..	Tehran	1964
College of Cinema and T.V. ....	Tehran	1967	Commercial Institute of Technology of Tabriz .....	Tabriz	1968
College of Mass Communication .....	Tehran	1960	Construction & Road Institute of Technology .....	Tehrran	1968
Civil Aviation .....	Tehran	1959	Food Sanitary Institute of Technology ..	Kermanshah	1969
Damavand College .....	Tehran	1967	Fariss Sanitary Engineering Technology Junior School .....	Varamin	1950
Firoozgar Higher Institute of Nursing ..	Tehran	1964	Forecasting Junior College .....	Tehran	1946
Fiance and Accounting College .....	Tehran	1956	Hostess Training Junior College .....	Tehran	1974
Ghazali School .....	Qazvin	1970	Ichthyology and Fishery Junior College..	Bandar Pahlavi	1967
High Institute of Telecommunication ...	Tehran	1938	Institute of Technology (13 institutes) ..	12 locations	
Industrial Management Institute .....	Tehran	1970	Junior College of Hygiene (6 schools) ..	6 locations	
Institute of Hospital Management .....	Tehran	1971	Junior Teachers' Training College (15 institutes) .....	15 locations	
Insurance Institute of Tehran .....	Tehran	1969	Junior Technical School .....	1964-72	
Iran Girls College .....	Tehran	1963	Kakhe Danesh Junior College .....	Tehran	1971
Iran Center of Management Studies ....	Tehran	1971	Mining Junior College of Shahrud ....		1971
International Management School .....	Tehran	1976	Midwifery Junior Schools of Kermanshah .....		1969-71
Korosh Kabir School .....	Esfahan	1972	O.R.T. Boy's and Girls' Technical Schools .....	Tehran	1962-65
Kashan School of Science .....	Kashan	1974	Statistics and Accounting Institute of Technology .....	Tehran	1967
Kermanshah College of Science .....	Kermanshah	1971			
Math. & Economic Management College.	Karaj	1972			
Nafficy School of Technology .....	Tehran	1970			
Nursing Institutes .....	10 locations				
Politechnique of Tehran .....	Tehran	1959			
Pars College .....	Tehran	1966			
Research Centre for Iranian Culture ....	Tehran	1969			
School of Construction .....	Tehran	1970			
School of Agriculture .....	3 locations	1967-72			
School of Commerce .....	2 locations	1957-68			
School of Iranzamin .....	Tehran	1968			
School of Social and Economic Sciences.	Babolsar				
School of Nursing .....	Quazvin	1969-70			
	Tehran	1957-73			

*List of Iranian Universities and Colleges Linked to U.S. Universities, 1976*

Iranian University	U.S. University	Date of Agreement	Objectives and Background	Areas Covered By Agreement
Abadan Institute of Technology..	Brown University	1970	Abadan graduate students to Brown, Brown faculty to Abadan	Engineering, Social Sciences
Aryamehr University of Science and Technology	Massachusetts Institute of Technology	1973-74	To facilitate transfer of students, joint research, faculty exchange	Aryamehr students to M.I.T. in engineering, M.I.T. faculty to Aryamehr
Engineering Department ....	M.I.T. Engineering Division			
Chemical Department .....	Michigan State University	1971	Teaching, research and service program in engineering, math, physical science	Exchange of research and teaching staff on sabbatical. Iranian faculty development, collaborative research
Azarabadegan University .....	University of Illinois, Urbana-Champaign			Medicine, social science, dentistry, agriculture
Medical School .....			Faculty and student exchange	
School of Agriculture .....			Collaborative research on soybeans	
School of Dentistry .....			Faculty development	
Social Science faculty .....			Faculty development	
University of Esfahan .....	University of North Carolina	1974	Informal links with the Carolina population center	Research on population
	University of Austin	1975	Student exchange	Persian studies, Public administration, English, Urban studies, International studies
Farah Pahlavi University .....	University of Florida, Gainesville	1973	Faculty development and exchange, curriculum development	Educational administration curriculum
Ferdowsi University .....	Georgetown University	1975	Faculty recruitment and exchange, faculty development curriculum, equipment procurement	Chemistry, Dentistry, Medicine, Physics, TEFL
	University of Illinois Urbana-Champaign	1976	Collaborative research	Psychology
The Free University of Iran ....	Florida State University	1976	Faculty development and teacher education	Educational technology
	Harvard University	1976	Paramedical Training Development	Educational technology
	Stanford University	1975	Faculty development	Educational technology
Jundi-Shahpoor University .....	University of California, Davis	1976	Faculty Development	Veterinary Medicine
The National University of Iran..	City University of New York	1976	Student exchange, Faculty development	Medicine, Social Sciences
School of Dentistry .....	University of Illinois Urbana-Champaign	1975	Faculty exchanges	Dentistry
Pahlavi University .....	Lewis and Clark College	1970	L. & C. students to Pahlavi	Special semester course in Persian culture
	Kent State University	1975	K.S. undergrads and grad students to Pahlavi	--do.--
School of Medicine .....	Johns Hopkins School of Medicine		Medical school residents exchange	Ophthalmology
School of Medicine .....	Yale University, School of Medicine	1976	Collaborative research	Pharmacology, cancer research
	University of Pennsylvania	1962	"Umbrella" Agreement	Medicine, Dentistry, Arts and Sciences
Pahlavi Population Center .....	University of North Carolina		Population center to establish the Pahlavi population center and aid project on information on family planning	Population
Razi University .....	University of Akron, Ohio	1976	University planning staffing and curriculum development	Sciences
Rezayeh College of Agriculture and Animal Husbandry	University of Illinois, Urbana-Champaign	1975	Faculty development collaborative research, and student exchange	Dairy Science, Agriculture
Reza Shah Kabir University ....	Harvard University	1975	To design structure of university and site plan	Sciences and Social Sciences



*List of Iranian Universities and Colleges Linked to U.S. Universities, 1976—Continued*

Iranian University	U.S. University	Date of Agreement	Objectives and Background	Areas Covered By Agreement
Teachers Training University ...	University of California, Los Angeles	1975	Faculty and Curriculum development	Education
University of Tehran				
College of Agriculture .....	University of Illinois, Urbana-Champaign	1975	Soybean research Faculty and student exchange	Agriculture
College of Dentistry .....	University of Florida	1976	Faculty exchange	
College of Dentistry .....	University of Illinois Urbana-Champaign	1975	Faculty exchange	Dentistry
College of Education .....	University of Illinois Urbana-Champaign	1976	Faculty exchange	Education
School of Medicine .....	University of Illinois Medical Center at Chicago	1976	Faculty exchange	Medicine
School of Medicine .....	University of Utah	1975	Faculty development	Medicine
College of Natural Resources..	Utah State University	1976	Memo of understanding student and faculty exchange	Range science
School of Public Health .....	Harvard University School of Public Health	1975	Graduate program, student and faculty exchange	Immuno-biology
Illinois/Tehran Research Unit	University of Illinois, Urbana-Champaign	1969	Umbrella Agreement	Various fields
Tehran University Language Center	University of Illinois, Urbana-Champaign	1970	Illinois M.A. interns to teach english in Tehran for M.A. credit at Illinois	English language training
School of Veterinary Medicine.	University of California, Davis	1974	Faculty development and exchange	M.S. in Preventive Veterinary Medicine
	University of Alabama	1972	University/university cooperation agreement	Engineering
Department of Music .....	Indiana University	1974	Student exchange	Music
Persian Studies .....	University of Utah	1970	Graduate student exchange	Persian studies
Persian Studies .....	University of Utah	1976	Graduate student exchange	Interdisciplinary M.A. program in Persian studies
Translation College .....	Western Illinois University	1975	Students from translation college to study 1 semester at W.I.U.	English
Zanjan Agricultural College ....	University of Akron (Ohio)	1976	Faculty Development Curriculum development	Agriculture
	Ohio State University			
	Pennsylvania State University			

Source: An analysis of U.S.-Iranian Cooperation in Higher Education, Overseas Liaison Committee, American Council on Education, November 1976.

# Electric Power

IRAN'S POWER system has developed rapidly since the Government nationalized the industry in 1964. Power output increased from 6.9 billion kilowatts per hour (kWh) to 15.7 billion kWh in 1975. Further expansion of generated power to over 48 billion kWh by 1980 is expected. The building of a national power grid which began in 1967 has been expanding rapidly and by 1976 covered over two-thirds of Iran's total installed capacity.

The projected growth in use of gas turbines and nuclear power stations signals the end of a Government policy promoting the expansion of diesel and thermal electric generating stations. U.S. manufacturers of gas turbines and nuclear power equipment should benefit most by Iran's expansion of the national power grid. Suppliers of power transmission and distribution equipment will also find good sales potential. The total market for electric power equipment is expected to rise from \$337 million in 1975 to over \$2 billion in 1980.

## STRUCTURE AND SIZE

Before 1964 the power industry was completely in the hands of the private sector. Growing demand by both industrial and private household consumers prompted the Government to establish a state-managed power system under the Ministry of Water and Power (since 1974, the Ministry of Energy—MOE). Iran's power system expanded rapidly during the decade (1963–73) of the Third Development Plan and the Fourth Development Plan.

In 1970 installed capacity was 2,358 megawatts (MW), and there were 1,259 miles of transmission lines (see table 1). By 1975, installed capacity totaled 4,870 MW with over 6,500 miles of high voltage transmission lines, 60% of which were 63 and 66 kilovolt; (kV) 25% were 132 kV and 32% are 230 kV. Over 66% of installed capacity had been linked into a national interconnected power grid system by 1976 (see figure 1).

Total capital expenditure in electric power generation, transmission and distribution facilities rose from \$178 million in 1970 to \$470.2 million in 1975 (see table 2). The public sector share of investment rose more rapidly than private investment. In 1970,

public sector capital expenditure was \$142 million, representing 79.8% of total investment; by 1975, public sector investment had risen to \$450.2 million, representing 95.7% of total expenditure for electric power production. Since 1973 there has been very little private investment in power generation, primarily because beginning in that year, the Ministry of Energy required all industries to use public power. In 1970 the Ministry of Water and Power generated 63% of all power in the country; in 1975, it produced 82% of all generated power and by 1980 less than 10% of all power is expected to be generated by captive power systems.

## Hydroelectric Generation

In 1975 the Ministry of Energy operated seven hydroelectric power stations with a total rated capacity of over 804.2 MW (see table 3). Hydroelectric generation plants provided approximately 25% of Iran's electricity in 1975. Of the 11 dams constructed during 1957/72, 8 were capable of hydroelectric power generation. Seven of these stations are now linked to the national power grid system.

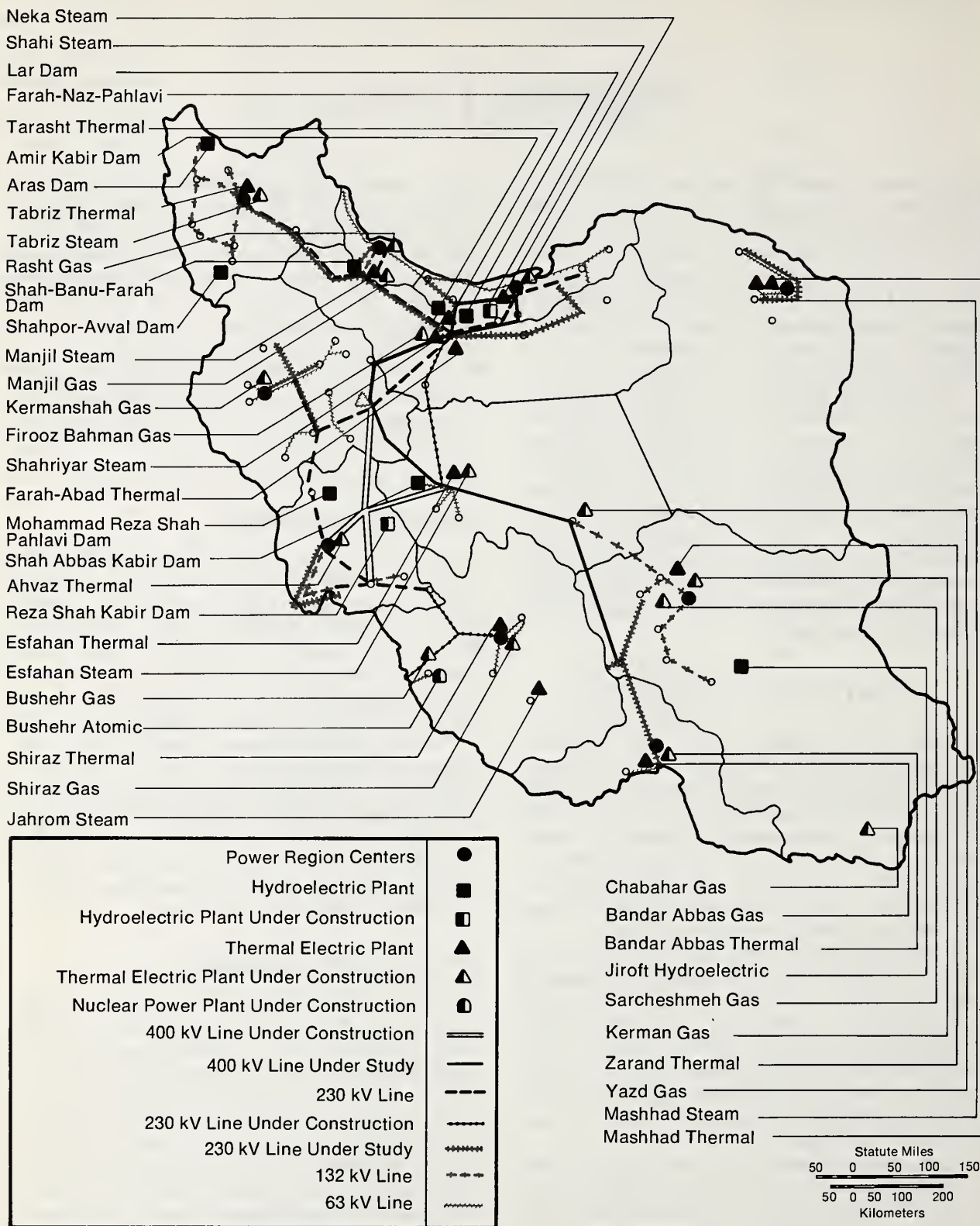
The largest hydroelectric power plant, the Mohammad Reza Shah Pahlavi Dam is located in Khuzistan, 15 miles from the city of Dezful. This plant has eight turbines of 65,000 kW capacity each and supplies power to the west central part of Iran through a 230 kV transmission line which is linked to the national grid system and runs from Ahvaz to Hamadan, a distance of 128 miles.

## Thermal Electric Generation

In the mid-1970's approximately 46% of public power generation in Iran was produced by steam power plants. In 1975, 16 publicly owned thermal generators with a total generating capacity of 1,586 MW in plants were located in eight areas. Four plants generating over 74% of all thermal power were connected to the national power grid system, while four locations with approximately 26% of installed capacity were isolated power stations used to supply industrial installations or small rural areas of the country. Shahriyar Power Station, located near Tehran, is the largest thermal power station in the



FIGURE 1.—Iran: Electric Power Development.



**Table 1.—Iran: Electric Power Development**

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
Installed Power Capacity (MW) <sup>2</sup>						
Hydro .....	517	804	804	804	1,804	1,944
Thermal .....						
Private .....	410	484	505	530	530	590
Public .....	437	1,359	1,587	1,576	2,082	6,150
Gas Turbines .....	136	241	410	610	727	1,475
Diesel Generators .....						
Private .....	523	780	859	891	970	1,235
Public .....	335	390	414	459	476	575
Total Installed Capacity .....	2,358	4,058	4,579	4,870	6,589	12,769
Generated Power (Million kWh)						
Hydroelectric .....	1,671	2,842	3,421	3,445	4,720	5,830
Thermal Electric .....	1,978	5,374	6,545	7,785	9,730	35,860
Gas Turbine Electric .....	155	541	688	955	1,134	2,340
Diesel & Gasoline Motor Electric .....	452	567	511	593	618	590
Total .....	4,256	9,324	11,165	12,778	16,302	44,620
Private Diesel Thermal Electric .....	2,673	2,769	2,340	2,925	3,012	3,400
Total Capacity .....	6,929	12,093	14,005	15,703	19,214	48,020
Length of Transmission Lines (miles)						
63 and 66 kV .....	380	2,589	2,778	2,812	2,952	3,780
132 kV .....	237	1,160	1,644	1,644	1,674	2,220
230 kV .....	642	2,015	2,069	2,099	2,160	2,800
400 kV .....	0	0	0	0	243	1,119
Total Length .....	1,259	5,764	6,491	6,555	7,029	9,919

<sup>1</sup> Estimated.

<sup>2</sup> Installed capacity is name plate rating for equipment.

Source: Ministry of Energy, estimates based on trade interviews.

**Table 2.—Iran: Budgeted Capital Expenditures for Electric Power**  
(Millions U.S. dollars)

Organization	1970	1973	1974	1975	1976	1980 <sup>1</sup>
Ministry of Energy .....	12.0	27.7	66.7	67.1	94.8	175.0
Atomic Energy Organization .....	—	—	16.2	23.1	994.3	1,150.0
Tavanir (Transmission/Distribution Co.) .....	120.0	130.0	106.9	203.6	395.9	480.0
Regional Power Companies						
Tehran .....	—	—	4.6	21.8	19.9	38.0
Fars .....	—	—	11.4	16.8	12.4	14.0
Esfahan .....	.4	.8	5.3	16.1	16.3	26.0
Khorasan .....	2.1	1.9	7.1	23.7	19.5	26.0
Mazandaran .....	4.3	7.0	6.0	8.5	7.1	18.0
Gilan .....	1.2	2.6	4.1	7.2	7.5	10.0
Azarbaijan .....	1.0	1.4	5.4	23.4	13.8	22.0
Western .....	—	.8	2.9	14.9	10.2	16.0
South Eastern .....	1.0	2.9	17.4	24.0	20.5	26.0
Total Public Capital Investment .....	142.0	175.4	254.0	450.2	1,612.2	2,003.0
Total Private Capital Investment .....	36.0	28.0	24.5	20.0	21.0	25.0
Total Planned Capital Expenditures .....	178.0	203.4	278.5	470.2	1,633.2	2,028.0

<sup>1</sup> Estimated.

Source: Official Government Budgets for 1970-76 and estimates based on trade interviews.

country. It presently has four General Electric (U.S.) steam turbine power units with an installed capacity of 624 MW. Power generated from this plant is used to supply the bulk of the residential and industrial requirements of Tehran.

## Gas Turbines

In the early 1970's, Iran made increasing use of gas turbines to generate electricity. In 1976, the 10 gas turbine power stations operating had 31 gas turbines installed with a total capacity of 610 MW.

Only one of these stations, Shiraz #2, was not yet connected to the national power grid. The Shiraz #2 station had five gas turbines ranging from 12 to 19 MW output which together accounted for over 13% of the total generation capacity of gas turbines in the country. A new plant for the state-run *National Iranian Copper Industries Corporation* in Kerman province became operational in 1976 with five gas turbines having a combined capacity of 125 MW of power generation. This power will be used to operate *National Iranian Copper Industries Corporation's* new smelters and other facilities.



Table 3.—Iran: Power Installations in Place 1975

	Generation Units	MW Rating	Total MW	Year of Commissioning
<b>Thermal-Electric (Steam)</b>				
Faharahbad (Tehran) .....	3	82.5	247.5	1970
Tabriz .....	2	6	12	1970
Zarand (Kerman) .....	2	30	60	1972
Shahabad (Esfahan) .....	2	37.5	75	1973
Manjil .....	2	120	240	1974
Jahrom (Fars) .....	2	1.25	2.5	1974
Shahriyar (Tehran) .....	4	156	624	1974
Mashhad .....	2	12.5	25	1973
Ahvaz .....	1	146	146	1975
Tarasht (Tehran) .....	4	12.5	50	1974
Total .....	27		1722.0	
<b>Hydroelectric Plants</b>				
Amir Kabir Dam .....	6	15.0	91.0	1961
Mohammad Reza Shah Pahlavi Dam .....	NA	NA	520.0	1963
Farahnaz Pahlavi Dam .....	1	22.5	22.5	1967
Shahbanou Farah Dam .....	5	17.5	87.5	1975
Aras Dam .....	2	11.0	22.0	NA
Shah Abbas Kabir Dam .....	2	21.6	55.2	NA
Shahpoor Aval Dam .....	1	6.0	6.0	NA
Total .....	17		804.2	

Source: Ministry of Energy

## Diesel Generators

Publicly owned diesel power generation plants had a total capacity of 459 MW in 1975. Only one-fourth of the total diesel power generation capacity had been connected to the main power grid network in 1975. Many of the 83 diesel generators were used as standby generators if a main power system failed or to supply additional power required at peak load times. The installed capacity of diesel generators has grown at the same rate as the overall growth of electric power capacity since 1970, but this source of power is expected to be used primarily on an auxiliary standby basis through the 1980's.

## Captive Power Generation

In 1975 captive sector facilities accounted for 29% of total installed capacity, but they were responsible for only 18.6% of actual power generation.

Captive power generation has been on the decline because the Government requires industrial plants to use the public power system rather than install their own power houses. Most power systems installed in 1975/76 by industrial customers were intended for standby power generation if main station power fails rather than primary power. The capacity of captive electric facilities grew 52% between 1970 and 1975 but actual power generation grew only 9% during the same period. Despite occasional shortages and failures, the performance by the public utilities has been adequate to meet industrial power needs. Other small generators were sold to

produce power for rural villages not connected to the main power grid.

The largest captive electric power system belongs to the National Iranian Oil Company (NIOC) which generates about 30% of all private power. Many of the older industrial plants, continue to generate their own power. New industrial plants, however, are seldom built with more than standby power equipment, unless they are located in an area not serviced by the Ministry of Energy.

## Transmission and Distribution

Since 1969 all power transmission and distribution has been the responsibility of the Transmission and Distribution Company of Iran (Tavanir), a MOE-owned company. In 1976 Iranian power authorities were engaged in expanding the national interconnected grid system. Transmission of 400 kV, which was limited to one 258-mile link from the Reza Shah Kabir dam in Khuzistan to Hamadan, is to be greatly expanded. Much of the existing grid system still runs on 63 and 66 kV transmission lines. Isolated power stations are being connected to the national grid system and by 1980 nearly all power stations are expected to be linked, except for those in such isolated areas as Chabahar in Baluchistan province.

The grid consists of an east-west corridor, which extends from Azarbaijan to Shahi. This will be linked to Mashhad. The north-south corridor, which runs only from Tehran to Hamadan, will be linked to the southern port of Bandar Abbas with a 400 kV

transmission link. The Ministry is working to upgrade existing power lines from 63 and 66 kV to 230 kV.

## Government Organizations

The Ministry of Energy has primary responsibility for the maintenance and expansion of the electric power network in Iran (see figure 2). It is located at the intersection of Varzesh and Kazhan Streets, Park-e-Shaho, in Tehran. In 1975, 29,500 persons were working directly on power-related activities in the Ministry, its nine regional power companies and subsidiary agencies. Thirty percent of the Ministry personnel were employed in financial and administrative jobs while 55% of the staff were engaged in power generation, transmission, and distribution.

Many functions of the Ministry have been decentralized and located in the regional power companies and other subsidiary agencies. The total government capital investment in electric power is divided among these various divisions of the Ministry. The nine regional power companies' budgeted investment of \$127 million in 1976 was down from \$156 million in 1975. Their function is to maintain the power system in the region under their jurisdiction and to supervise construction of new facilities.

Tavanir (Sherkate Sahami Tolid Va Eteghai Niroo) was established as a subsidiary department by the Ministry of Water and Power in 1969 to build and maintain the nation's electric transmission and distribution system. Tavanir's capital expenditures, budgeted at \$396 million in 1976, have risen rapidly largely due to the expansion of the national power grid system.

SATKAB, located within the Ministry of Energy, is the central purchasing agency of the Ministry.

The Atomic Energy Organization of Iran (AEO), established in 1973, is responsible for the purchase, installation, and operation of all nuclear power plants. It is an independent agency responsible to the Prime Minister. Of the \$1.6 billion in fixed investment planned for all power-related activities in 1976, \$994 million was budgeted for the purchase of nuclear reactors.

## TRENDS, PROGRAMS, AND PROJECTS

Per capita power consumption has been rising at an annual rate of 16% since 1970. In 1964 annual per capita usage was 138 kWh, but by 1975 this figure had risen to over 490 kWh per capita. In 1970, the Ministry of Energy provided power to approximately 1.1 million households; by 1975 the number of households supplied had risen to almost 2 million, a 15% annual increase (see table 4). Iranian industry also has been increasing its power consumption. In 1974, four industrial units: the steel mill in Esfahan, the aluminum smelter in Arak, and two large cement plants, consumed close to 15% of all power generated in the country. In 1975, industrial plants used over 55% of all power generated by the Ministry and 63% of the total power generated in the country.

Power shortages in the north-south power grid during 1975 averaged 300,000 kWh daily. Power shutdowns have been occurring on a planned schedule for industrial and residential users located near Tehran. Nearly every night blackouts occur in different areas of the city and the surrounding industrial areas. The main reason for this has been the fact that during 1974 and 1975 the annual growth in consumption averaged 16% and generation capacity rose an average of only 13%.

The Ministry undertook a \$3.4 billion program during the Fifth Development Plan (1973/74-1977/78) to provide for the power generation needs of a growing industrial country. From 1963 to 1972, the Ministry concentrated on the building of hydroelectric and thermal electric power stations. The output of thermal plants rose from 1,978 million kWh in 1970 to 5,374 million kWh in 1973. The continued effort to build thermal electric stations to provide power for the nation's industrialization has been due to the limited potential for hydroelectric power stations. In 1970, thermal electric generation accounted for 35.9% of installed capacity and 57% of output. The increasing use of gas is a logical result of the desire to utilize natural gas resources which previously had been flared. Another factor

Table 4.—Iran: Growth of Public Utility Customers

	1970		1973		1974		1975		1976 <sup>1</sup>		1980 <sup>1</sup>	
	No. <sup>2</sup>	% of Use <sup>3</sup>	No. <sup>2</sup>	% of Use <sup>3</sup>	No. <sup>2</sup>	% of Use <sup>3</sup>	No. <sup>2</sup>	% of Use <sup>3</sup>	No. <sup>2</sup>	% of Use <sup>3</sup>	No. <sup>2</sup>	% of Use <sup>3</sup>
Household .....	1,089	20	1,510	18	1,714	18	1,959	18	2,210	20	3,200	20
General & Trade .....	278	20	366	20	400	19	460	20	520	20	650	19
Industry .....	6	50	9	52	8	55	8	57	9	58	11	58
Others .....	6	10	7	9	8	8	8	5	8	2	9	2
Total .....	1,379	100	1,895	100	2,133	100	2,435	100	2,747	100	3,870	100

<sup>1</sup> Estimated.

<sup>2</sup> Number of customers in thousands.

<sup>3</sup> Percentage of total power generated.

Source: Ministry of Energy.



is the short lead time for installation of gas turbine plant facilities compared to thermal and hydroelectric generation plants. In 1970 only 155 million kWh of energy was produced by gas operated plants, but by 1975 they generated 955 million kWh of energy.

There has been a marked decline in the use of diesel generators. The Tarasht Power Station, located in Tehran, had used diesel generators since the early 1960's. Partially because of environmental concerns and also to meet the demand of increased consumption in the capital, the Ministry converted this plant to gas turbines and retained the diesel generators for use only during periods of peak power requirements. Most diesel generators installed in the early 1970's were used for remote areas as part of the MOE program to provide power throughout the country. Power generation by diesel generators fell from 15% to less than 10% of total electric power between 1970 and 1975. The MOE policy of relying primarily on gas and thermal electric power plants will limit diesel power generators to less than 5% of all power generation by 1980.

## New Power Development

The Ministry of Energy is constructing a large number of new power facilities scheduled to be completed between 1976 and 1983 (see table 5). The Ministry in 1975 had a number of thermal electric plants being constructed. However, MOE tenders let in 1975 and early 1976 were aimed at increasing

gas turbine generation capacity. New hydroelectric and thermal power facilities are being cut back in favor of gas turbine plants and also Iran's nuclear power plant commitments.

## Nuclear Power

In the 1976/77 fiscal year, the budget for the Atomic Energy Organization of Iran included \$994 million for capital expenditures on nuclear plants. AEO capital expenditures are anticipated to grow to \$1.1 billion annually in the 1980's. The only nuclear reactor in the country in 1976 was located at Tehran University and used for research purposes. Installation of atomic power plants is a major goal of Iran's public utility industry. In 1975 two reactor orders were placed with a French supplier and two with a West German supplier. Plans call for Iran to generate 24,000 MW of atomic power by 1994.

The West German firm of Kraftwerk Union GmbH will install two 1,200 MW pressurized water reactors in Halileh located on the Persian Gulf. These plants are likely to begin operations in 1982 and will require an investment of almost \$1.8 billion. Kraftwerk Union will supply six loads of fuel along with the reactors worth an additional \$1.2 billion. Framatome S. A. (France) has been awarded a contract to install two pressurized water reactors of 900 MW capacity each on the Karun River near Ahvaz. These two reactors will require an investment estimated at \$1.2 billion.

Table 5.—Iran: Major Power Generation Projects 1975-85

Plant	Power Source	Units/ Turbines To Be Installed	Total Power (MW)	Contractor	Completion Date	Costs (Millions of U.S. \$)
Bandar Abbas .....	Thermal Electric	4	1280	GIE	1977	332
Ramin .....	Thermal Electric	4	1260	Techniprom Export	1978	220
Neka .....	Thermal Electric	4	1760	Brown-Boveri	1978	715
Esfahan .....	Thermal Electric	1	600	GIE	1978	102
Ahvaz .....	Thermal Electric	1	146	General Electric Co. Limited	1979	52.5
Tabriz .....	Thermal Electric	2	600	Alsthom S.A./Hitachi Ltd.	1979	276
Halileh .....	Nuclear	2	2400	Kraftwerk-Union	1982	1,800
Karun R. ....	Nuclear	2	1200	Framatome S.A.	1983	1,200
Persian Gulf Coast .....	Nuclear	6	7200	NA	1985-7	4,500
Reka Shah Kabir .....	Hydroelectric	4	1000	NA	1977	200
Lar Dam .....	Hydroelectric	1	140	NA	1978	NA
Shahpour Chemical .....	Gas Turbine	1	15	Westinghouse (Canada)	1977	2.5
Parsnylon Company .....	Gas Turbine	2	NA	AEG-Kanis Turbine Fabrik GmbH	1978	4.9
Chahbahar .....	Gas Turbine	6	150	Alsthom S.A.	1977	NA
Mashhad .....	Gas Turbine	6	158	Brown-Boveri	1977	NA
Loshan .....	Gas Turbine	2	120	Kraftwerk-Union	1977	NA
Rey .....	Gas Turbine	8	200	Hitachi Ltd.	1978	NA
Shiraz .....	Gas Turbine	2	44	Brown-Boveri	1978	NA
Shiraz .....	Gas Turbine	3	42	Fiat-Axlis	1977	NA
Yazd .....	Gas Turbine	2	50	Alsthom S.A.	1977	NA
Sar Chesmeh Copper .....	Gas Turbine	5	125	Alsthom S.A.	1976	NA
Tehran .....	Gas Turbine	NA	175	(Not Tendered)	1978	NA
Esfahan .....	Gas Turbine	NA	100	(Not Tendered)	1978	NA
Tabriz .....	Gas Turbine	NA	75	(Not Tendered)	1979	NA

Source: Ministry of Energy.

## Thermal Electric Power

The Ministry of Energy began six projects for new plants in 1975 and 1976. These six plants, the smallest of which has a 146 MW capacity and the largest 1,760 MW, will add 5,683 MW additional installed capacity in the country.

The construction of thermal electric power stations will continue in the late 1970's with the result that by 1980, almost 60% of Iran's total power capacity and approximately 75% of actual output will be provided by that source. The Ministry has awarded six projects to construct large thermal electric plants. The largest of these is the Neka power station located in the northern province of Mazandaran. Brown Boveri S.A. (Switzerland) has been awarded the contract to construct the Neka plant which will have four steam units with a combined capacity of 1,760 MW. This will be the largest thermal electric plant in the Middle East, and it will be used primarily to boost power supplied to Tehran. The plant will begin operation by 1978 and will cost an estimated \$715 million.

The contract for construction and equipment of another large plant, slated for Ramin in the south of Iran, has been awarded to the Soviet state firm, Techniprom-Export. This plant, which will consist of four steam units with a total capacity of 1,260 MW and cost \$220 million, is expected to begin operations in 1978. The British General Electric Company, Ltd. won two tenders in 1975. One of these, a \$330 million, four unit, 1,280 MW plant for the port of Bandar Abbas, will be operational in 1977. This plant will provide power for the new steel plants currently under construction there. The other project is a 330 MW steam plant in Esfahan to cost \$102 million. This unit is expected to be operational in mid-1978.

Alsthom S. A. (France) and Hitachi Ltd. (Japan) are to build a 772 MW thermal plant in Tabriz. The \$276 million contract, which calls for completion of the plant in late 1979, was awarded in mid-1976. The General Electric Company, Ltd., (U.K.) also has been awarded a \$2.5 million contract to supply a 146 MW steam unit to Ahvaz.

## Gas Turbine Electric Power

New projects and expansion of existing facilities will increase gas turbine power generation from 955 million kWh in 1975 to over 2,300 million kWh by 1980. The use of gas turbines to power steel mills in Ahvaz, Mashhad, and Esfahan and the availability of natural gas are factors in the increase.

There are a number of gas turbine plant projects in Iran, and more are expected to be developed in the late 1970's. In 1976 the Sar Cheshmeh electric plant began production giving the *National Iranian*

*Copper Industries Corporation* project 125 MW of power for the operation of its nearly completed copper smelter. Expansion of the Kerman and Manzil gas turbine power plants was in progress in 1976. The Chahbahar power station, part of the often-delayed Chahbahar port project, was put out to tender in 1976. It will consist of two 25 MW units which will supply power for the city and a desalination plant located near the port. Other projects include a 75 MW plant in Firooz Bahman, a 120 MW plant in Rasht, a 120 MW plant in Khorramshahr and a 50 MW plant in Yazd, all of which are scheduled to be contracted for construction by the end of 1977.

## Hydroelectric Power

Iran has a limited number of potential sites for hydroelectric projects. Five new dams, two of which include hydroelectric power stations, were under construction in 1975. One of these dams, the Reza Shah Kabir Dam in Khuzistan will have four turbine generators which combined will be capable of producing over 1,000 MW of continuous power. This plant, which will be the largest hydroelectric plant in the country, was slated to become operational in late 1977. The cost of the plant has been estimated at over \$200 million. An additional hydroelectric power station near Tehran is being constructed in conjunction with the Lar Dam project. This dam, to



One of the complexes of gas turbine generators installed at Shiraz is shown above. Gas turbine power generation is slated to increase by nearly 1,500 kWh by 1980.



be operational in 1978, will have 140 MW of installed generation capacity to help meet the growing power requirements of the Tehran area.

## **Transmission and Distribution**

In 1976, Tavanir began to implement a number of 400 kV transmission line projects. The first of these was awarded to Asea AB (Sweden). This line will run 258 miles to provide power from the Reza Shah Kabir Dam in Khuzistan to the national power grid network. Other projects to be tendered in 1977 and 1978 include a 414-mile, 400 kV line in the Arak area, a 168-mile 400 kV line from Mazandaran to Tehran and another 400 kV line running 86 miles from Rudeshur to Jalal. A 230 kV line also has been proposed to run 9.6 miles in the region of Ahvaz in southern Iran.

New power substations for handling the 400 kV transmission lines will also be built both to link up new power stations to the national power grid and to service towns and cities along these routes. New high-voltage transformers needed to distribute power in the 400 kV transmission lines will be purchased.

## **GROWTH PROSPECTS**

The Government has been successful in implementing its plans for expansion of electric power. The large capital investment needed for continued development of the sector has been committed. For 1975-89, over \$6.5 billion already has been pledged for expansion projects, including four nuclear reactors. Projects already being constructed will double installed power capacity between 1976 and 1980.

The Fourth Development Plan projected that installed capacity would be over 4,500 MW by March 1973. However, due to construction delays, the Ministry of Energy fell short of this goal and ended the plan period with just over 4,000 MW capacity. The remaining planned capacity, however, was in place by the following year. Iran's Fifth Development Plan calls for increases in power capacity to 8,000 MW by March 1978. This goal will not be met but an increase to 6,500-7,500 MW will be obtained. Projects becoming operable in 1978 to 1980 will add an additional large amount of new capacity and should satisfy the country's needs for electric power to 1986.

In large measure, Iran's long-range plans for expansion of electrical capacity are based on the construction of nuclear plants. The Atomic Energy Organization of Iran expects to add 23,000 MW of nuclear capacity by 1994. Of this, projects totaling 4,200 MW capacity had been committed by the end of 1976. The Atomic Energy Organization has restricted the size of reactors to 1,200 MW maximum capacity. To reach the goal of 23,000 MW by 1994,

four reactors of the approved size will have to be commissioned and built every 3 years, but problems of safeguards and waste disposal may delay this AEO timetable.

The Government has used its increased revenues from oil sales to speed up the construction of generation capacity. By 1980, existing and new projects are expected to produce 48,000 million kWh of electric power, an increase of 592% in a decade. Power consumption growth which averaged 16% from 1970 to 1975 will increase to 19% during 1976-80. Industrial expansion, particularly in high-energy industries such as steel and aluminum production, coupled with a rise in household consumption, had put a strain on generation capacity. This was especially true in the area of Tehran which consumes about 40% of the country's energy. These shortages are expected to be relieved by 1979 through the addition of the Lar Dam generator and the Neka Thermal Plant. However, if rainfall is low and hydroelectric power production must be reduced as it was in 1975, shortages may occur for both industry and households during 1977-79. The projected 37% annual growth in power generated will meet the increased industrial and domestic consumption demands through 1980. However, any delays in the completion of ongoing projects plus delays in linking new power stations into the national power grid network may cause power blackouts to continue in areas of high power consumption during the next decade.

## **CAPITAL GOODS MARKET**

Total sales of electric power generating and transmission equipment in Iran were \$337 million in 1975 and are expected to grow to over \$2 billion by 1980 (see table 6). Sales of power generation equipment are expected to grow from \$134 million in 1975 to \$1.8 billion by 1980. This large increase will result from the installation of four nuclear reactors which will be imported during 1979-81. Sales of conventional power generation equipment should represent over \$187 million or about 10% of the 1980 generation equipment market.

Electrical transmission and distribution equipment has historically represented 55-65% of total imports of power equipment. In 1975 sales of this equipment in this category amounted to \$203 million, while 1976 sales dipped slightly to \$185 million. By 1980 sales of transmission and distribution equipment are expected to grow to over \$268 million, of which domestically manufactured products will satisfy only 3% of total market needs. A program for doubling power generation during 1976-80, which includes several new projects in the interconnected grid power network the main reason for this projected rapid growth.

**Table 6.—Iran: Size of the Market for Electric Power Equipment**

(thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>ELECTRIC GENERATION EQUIPMENT</b>					
Domestic Production ..	720	3,600	9,000	12,000	27,000
Imports					
United States .....	10,571	11,242	20,069	22,075	27,000
West Germany .....	10,541	10,834	34,918		
United Kingdom ....	4,983	6,344	14,309		
Italy .....	2,212	2,739	7,094		
France .....	4,191	5,863	16,509		
U.S.S.R. ....	892	2,587	532		
Japan .....	2,618	4,895	16,725		
Others .....	4,355	7,536	15,032		
Total .....	40,363	49,576	125,188	130,085	1,774,000
Exports .....					
Market Size .....	41,083	55,640	134,188	142,085	1,801,000
<b>ELECTRICAL TRANSMISSION AND DISTRIBUTION EQUIPMENT</b>					
Domestic Production ..	700	2,400	3,300	3,900	7,600
Imports					
United States .....	3,873	11,002	40,447	19,350	25,750
West Germany .....	17,370	28,393	53,606		
United Kingdom ....	10,109	9,223	13,810		
Japan .....	8,816	10,200	30,398		
France .....	7,533	4,522	17,689		
Others .....	16,505	24,171	43,803		
Total .....	64,206	87,511	199,753	181,700	262,000
Exports .....	10	22	56	130	870
Market Size .....	64,896	89,889	202,997	185,470	268,730
<b>TOTAL ELECTRIC POWER EQUIPMENT MARKET</b>					
Domestic Production ..	1,420	6,000	12,300	15,900	34,600
Imports					
United States .....	14,444	22,244	60,516	41,425	52,750
West Germany .....	27,911	39,227	88,524		
France .....	11,724	10,385	34,198		
Japan .....	11,434	15,095	47,123		
United Kingdom ....	15,092	15,567	28,119		
Others .....	23,964	37,033	66,461		
Total .....	104,569	139,551	324,941	311,785	2,036,000
Exports .....	10	22	56	130	870
Total Market Size .....	105,979	145,529	337,185	327,555	2,069,730

<sup>1</sup> Estimated.

Source: UN-23 Country Export Statistics 1970-75. Official Iranian Import Statistics and Estimates based on trade interviews.

Over 90% of all power equipment sold in Iran during 1975 was purchased by the Ministry of Energy and its nine regional power companies. Captive power systems have been declining rapidly as a proportion of the total equipment market since 1967. In 1975, generation equipment sales to private companies were just over \$33 million. By 1980, despite an anticipated increase in expenditures for private power systems to over \$55 million, this sector will represent less than 3% of the total equipment demand.

## Imports

Although there has been some Iranian manufacture of power equipment for several years, more than 95% of all electric power equipment was imported in the early and mid-1970's. By 1980, despite an approximate growth of 25% per year in locally manufactured equipment, the market share for domestically supplied equipment is expected to decline to less than 2%.

**Generation Equipment.**—The leading suppliers of generation equipment to Iran in 1975 were those from the United States (market share 15%), West Germany (28%), France (13%), Japan (13%), and the United Kingdom (11%). The reasons for the dominance of suppliers from these countries is their ability to provide the MOE with very large generating equipment using either gas turbines, steam electric plants or large diesel generators. West German suppliers are the market leaders in sales of steam-electric power plants, while U.S. and U.K. firms are the major suppliers of gas turbine plants. Firms from other countries, notably Italy and the Soviet Union, have signed contracts for large power plants which will be installed during 1976-80. Contracts for nuclear plants have been awarded to suppliers from West Germany and France. Iran will probably order additional reactors, and suppliers will be selected to provide installations during 1977-85.

Japanese suppliers also were very active in the mid-1970's in the sale of diesel generation equipment to the captive power sector. The signing of a contract by a Japanese company for the building of a power plant in 1976 signaled the entry of Japanese suppliers into the important area of large MOE thermal power projects. It is expected that aggressive financing and bidding by Japanese firms will result in a major increase in sales of Japanese power equipment by 1980.

**Transmission and Distribution Equipment.**—In 1975, West German suppliers satisfied over 26% of the total Iranian import market for transmission and distribution equipment. U.S. suppliers in 1975 accounted for just over 20% while Japanese suppliers (15%) and French suppliers (9%) were the other leading supplier countries. Iranian imports of transmission and distribution equipment more than doubled in value from 1974 to 1975, amounting to nearly \$200 million in 1975. Sales from all major supplier countries with the exception of the United Kingdom more than doubled during that period. British suppliers held 11% of the export market in 1974, while in 1975 their market share fell to only 7%. The main reasons for the decline were slow deliveries from the United Kingdom, and the more readily available financing for purchases from sev-



eral other countries. Japanese suppliers tripled sales from the previous year in 1975. A considerable portion of this increase was attributable to a large Japanese sales contract for supply of transmission line insulators to the Ministry of Energy. A number of suppliers from other countries, such as Spain supplying cable and Sweden supplying transmission line equipment, are beginning to get a solid foothold in Iran. In the late 1970's major suppliers from the United States and West Germany will find some of their sales reduced due to this increased competition.

## **Domestic Manufacturing**

Iranian electric power equipment manufacturing is still in its infancy. In 1975, Iranian suppliers were able to produce only 4% of total market requirements. In the mid-1970's there were only a few power-related equipment suppliers in Iran that could be classified as industrial companies as opposed to workshop units operated on a job-shop basis.

Iran-Transfo Company is a joint venture between Siemens GmbH (West Germany) and Transformer Union GmbH (West Germany) which have a combined 45% equity in the company, the Ministry of Energy which through its SATKAB subsidiary has 45% equity, and the Industrial Mining and Development Bank which provided the financing for the venture and has the remaining 10% equity. This firm is the only domestic manufacturer of 50-1,000 kilovoltampere (kVA) transformers. Production began in 1968 with output of 16,000 kVA. By 1974, total output was 1,140,000 kVA representing 95% of planned plant capacity.

Pakhsh Cable Company is another domestic manufacturer which sells low voltage cable to the Ministry of Energy. As of 1976, neither Pakhsh nor the other two Iranian cable producers manufactured high voltage transmission cables. Iran Bakya Cable Company, which is a joint venture between an Iranian private group and the American Chain & Cable Company, Inc. (U.S.) built a new manufacturing plant in Shiraz in 1975 and plans high voltage cable production in 1978 or 1979. In the past they have supplied low voltage cable for the Ministry of Energy but are concentrating now on telephone cables (see Telecommunications chapter).

Machine Sazi Arak Company is part of the Iran Development and Renovation Organization manufacturing steam boilers for industrial and commercial power plants. Production in 1975 was about 4,000 units.

Koutor Sazi Iran, a part of SATKAB, is a supplier of locally produced active and reactive electric 1-3 phase power meters. Approximately 300,000 power meters were produced annually in the mid-1970's. Iran Meter Manufacturing Company located

in Qazvin manufactured 300,000 household electric meters annually for the Ministry of Energy in 1974 and 1975.

Exports of power generation and transmission equipment are negligible and will continue to be very small through the 1980's.

## **MARKET OPPORTUNITIES**

**Fossil Fuel Steam Generating Plants.**—In 1977 Iran's electric power projects were focused on gas turbines and nuclear power plants. There were no plans by the Ministry of Energy for new thermal power projects.

There has been little interest in fossil fuel steam plants in the private sector due to government regulations which discourage their installation. The increased availability of power and the expansion of the interconnected grid network resulted in the government decision that these private investments were unnecessary.

**Diesel Generation Plants.**—The Ministry of Energy purchased around 2,500 diesel generators yearly during the 1970's in its program to provide power to all rural communities in the country. These generators are for the most part 150 (kVA) and above. Another 1,500 units were purchased by industrial firms and businesses as either addition or standby power sources. In 1975, due to the shortage of rainfall, electric power in Tehran was cut by almost 3% and phased blackouts occurred during peak generation hours. As a result of power cuts, many movie theaters, hospitals, government buildings, and restaurants have begun to purchase small standby generators. Since blackouts are forecast to occur in Tehran until 1979, sales of diesel generators for secondary purposes are expected to continue to be strong for the next several years. In some localities industrial establishments, which fear that power to industrial concerns will be cut or consumption regulated on a quota system, are ordering auxiliary diesel generators to anticipate these shortages.

**Gas Turbine.**—Opportunities are excellent in both the private and public sector for sales of gas turbine generator sets. In 1976, the Ministry of Energy had contracts for an additional seven gas turbine plants which should be operable by 1980. Additional contracts for gas turbines are certain because of the short period of construction-to-commissioning time involved. The Ministry is mindful that 54% of all natural gas in the country was still being flared in 1976 and can be used as a cheap source of fuel for gas turbines. Most government-owned companies are being forced to convert their present power systems to natural gas and will have to install gas turbines.

**Hydroelectric Power Generation Plants.**—Iran's capacity for expanding hydroelectric power plants is severely limited. The only project still to be completed is the Lar Dam power plant which will be operational in 1979. A number of new dams being built with Soviet technical assistance on the Aras River near Tabriz might include some additional plants, but there are few locations left which would be suitable for large hydroelectric power stations.

**Nuclear Power Plants.**—Iran expects to add 23,000 MW of nuclear power into the nationwide electric grid by 1994. Contracts for four reactors had been awarded by 1976, and these will bring the Atomic Energy Organization to 18% of its 1994 goal by 1983. In all it plans to purchase between 15 and 20 nuclear generation plants in the late 1970's to mid 1980's.

**Transmission and Distribution Equipment.**—The two major objectives of the Ministry of Energy are to bring electric power to all rural areas of the country and to interconnect all major plants under one nationwide power grid system. The implementation of these goals has caused a rapid increase in sales of transmission and distribution equipment. Iranian manufacturers do not as yet produce high-voltage transmission lines and Tavanir, which handles the transmission and distribution projects for the Ministry, has indicated a desire to have main trunk lines of the national power grid be of 400 kV capacity. In addition to the expansion of the main grid system, new projects to be completed from 1976 to 1980 will serve to increase sales of equipment ranging from transmission towers to insulators and cables. The other objective of the Ministry, to provide power to all of Iran's inhabitants by 1985, has already been responsible for sales of a large number of power transformers. Purchases of 33 kV transformers have been large as have purchases of related equipment such as low voltage cable, connectors, and copper leaders.

**Technology and Service Opportunities.**—In the mid-1970's, the Ministry of Energy employed some consultants for training of personnel. These consultants were usually provided by foreign firms collaborating with an Iranian company. Various consulting companies working in Iran also periodically furnish experts to work on specific MOE projects of short duration. There will be a market for all aspects of nuclear power technology, and the Atomic Energy Organization has already signed an \$8.9 million contract with the U.K. atomic energy authority to establish a nuclear inspectorate for safety centers in the country.

## MARKETING ENVIRONMENT

### Buyers Universe

The buyers universe in Iran is dominated by the Ministry of Energy, its nine regional power companies, Tavanir, and other affiliated organizations such as the Atomic Energy Organization. Hundreds of industrial and commercial companies account for the balance of sales of power equipment.

SATKAB is the central purchasing agency of the Ministry of Energy. It buys all the requirements of the Ministry and the nine regional power companies. It also draws up and places tender specifications for bidding on smaller items such as insulators, fuses, line equipment, guy clamps, test and measuring equipment, and small transformers, as well as major distribution projects. All major purchases are done by international tender.

The Ministry of Energy does not use foreign consultants on power projects. In view of its experience in large projects gained since the mid-1960's it feels that tender specifications and station design can be developed by its own staff. It should be noted, however, that the Ministry often relies on technical experts from foreign contractors who can offer technical advice on particular power project requirements.

The Atomic Energy Organization, under the supervision of the Ministry of Energy, has its own separate budget for the purchase of atomic reactors and auxiliary equipment. All nuclear plants will be handled by this organization.

**Government Companies.**—State-owned companies are involved in primary metal processing, steel industries, and military equipment component manufacture. They account for almost one-fourth of all fixed capital investment in industry each year. For these companies, purchases of power equipment are normally handled through the government-owned Foreign Transactions Company. Large equipment purchases must by law be open to international tender. Major state-owned industries such as the railroad, oil, and natural gas companies use their own purchasing departments for issuing tenders and do not go through the Foreign Transactions Company.

**Private Industrial and Commercial Companies.**—Over 490 large manufacturing plants are located in Iran. About one-third of these plants currently have power generators either for primary power or standby purposes. The owner of the firm normally makes decisions in regard to power systems. Since 1973, industrial plants have been required to use public power to get permission to manufacture.

In the mid-1970's smaller workshops and most commercial companies relied solely on the public utilities for their power requirements. Many hotels,



theaters, hospitals, and other essential service organizations that need continuous power were purchasing standby power generators. Auxiliary power systems also were used in companies having computer facilities and this market, which requires an uninterrupted power supply, numbered approximately 260 customers in 1976.

## Engineering and Consulting Firms

The Ministry of Energy uses its own personnel to write project design and technical specifications for its projects. The use of outside consultants is limited except for the new nuclear plant projects for which the Atomic Energy Organization uses consultants extensively. Representatives of foreign companies which supply power equipment act unofficially in helping to prepare technical specifications for MOE projects.

The Ministry of Energy mainly tenders power plant projects on a turnkey basis; the prime contractor, who is always the supplier of the main power generation unit, puts together the engineering and construction part of the contract. Prime contractors use Iranian or, in some cases, foreign-based engineering companies located in Tehran, and Iranian construction companies which do the actual erection and installation of the facility. While the use of foreign construction companies to provide engineering services is widespread, there is a growing tendency to make more use of qualified Iranian engineering firms to supervise installation and render other services on projects. The roll of foreign engineering companies is diminishing. Little construction of facilities is being done by foreign contractors except for some hydroelectric projects. It is almost mandatory that foreign power plant suppliers subcontract facilities construction to Iranian firms.

## Foreign Suppliers Universe

In 1976, there were 8 major suppliers of turnkey electric generation plants in Iran and 10 to 15 major suppliers of diesel generation equipment; some 45 foreign companies regularly supply the transmission and distribution equipment market in Iran. All of these firms have been supplying the public utility market and most of them are selling through authorized representative Iranian companies. Only the companies with large turnkey power generator capability had established branch offices in the country. A number of large thermo-electrical and nuclear power plant projects have been awarded on the basis of trade agreements between Iran and other countries based on Iranian petroleum exports. For example, the purchase of nuclear plants from French firms resulted from a Franco-Iranian trade protocol. The Soviet supplier Techniprom-Export has been suc-

cessful due to the low prices they bid in international tenders for large turnkey plants. Other East European countries often make very attractive offers based on flexible pricing positions, as is the case with Soviet suppliers.

In the mid-1970's, leaders in sales of turnkey power plants were General Electric Company (U.S.) and Westinghouse Electric Corp. (U.S.), Brown-Boveri S.A. (Switzerland), Transformer Union GmbH (West Germany), Westinghouse Alstrom Company (France), Techniprom-Export (U.S.S.R.), General Electric Limited (U.K.) and Skoda Company (Czechoslovakia). The largest U.S. supplier of diesel generators was Caterpillar Tractor Co. (U.S.) with about 8% of the market followed by Ingersoll-Rand Co. (U.S.) with 7%. Other U.S. suppliers selling in the market were General Motors Corp., Cummins Engine Company Inc., Studebaker-Worthington, Inc., and Onan Company. West German suppliers active in the market included MAN GmbH and Deutz GmbH, while the United Kingdom's two major suppliers were Broomwade, Ltd., and Perkins Limited. The market leader among all foreign suppliers was Skoda Company (Czechoslovakia) which held an estimated 15% of the total diesel generator market and was particularly strong in the 1,000-1,500 kV range. Stork Werspoor S.A. BV (Netherlands) was also increasing its sales as were several Japanese suppliers, namely Kubota Company and Yanmar Company, who were selling small diesel generators to specific agricultural markets.

It is notable that, of the main suppliers of transmission and distribution equipment to Iran, each successful firm was selling a very limited range of products rather than supplying a large number of items. In the mid-1970's, the major suppliers from the United States included Telelect Co. (line equipment) and McGraw-Edison Co. (fuses). Leading Japanese suppliers were Mitsubishi Company (copper leaders) Hozda Co. (fasteners) and Marubeni Co. (insulators and cables). ASEA Co. (Sweden) was strong in sales of power substation equipment and insulators. Finnish suppliers have concentrated on selling wooden transmission poles with both Sir Lashious Company and Impregno Company winning contracts from SATKAB in 1974. West German suppliers included General Electric Company (U.S.) subsidiary AEG GmbH for cables and connectors. Other market suppliers included the Austrian firm of Cutz and Clump Company (line equipment), Jerry Sheri Company of India (insulators), Exomeza Company of Spain (cable and transmission line equipment) Brown-Boveri S.A. of Switzerland (fuses) and Delyon of France (cables).

## Marketing Factors

In the mid-1970's, large sales to the Ministry of Energy were normally shipped from supplier manufacturing plants to Iran. The marketing and servicing of turnkey power plants generally was done through Iranian branch offices while sales and service of small items of equipment and diesel generators were handled largely through authorized Iranian representatives located mainly in Tehran.

One of the most important criteria in the 1970's for both private and government purchases of power-related equipment was delivery times. Pricing of the equipment, while an important consideration, was not the sole criterion for selection either by private industry or by the government utility.

In 1974 and 1975, financing was not a factor in sales. However, by 1976 financing had become an important consideration in winning tenders. Consequently, the capability to draw on competitive national export credits became a key factor, particularly in sourcing decisions by the multinationals and the formation of sales consortia by supplier groups. In the category of diesel generator sales, product availability was a crucial factor followed by trust in brand names. Transmission and distribution equipment suppliers relied on product delivery factors to win MOE contracts for supply through 1976.

New large power projects involving mainly thermal-electrical nuclear plants are increasingly awarded on the basis of trade agreements. Other factors for large power projects that must be tendered, include long-term supplier relationships which can influence the development of technical specifications for tender documents. Foreign suppliers have often found it effective to associate with Iranian engineering and consulting firms in this regard.

There are 15-30% tariffs on imports of electric generators and transmission equipment. Iran Transfo Company, which manufactures 500-1,500 kV transformers, enjoys import protection for the range of transformers it has in production, and importation of these products is restricted. All other items and equipment are allowed to be imported. Unlike some

other government agencies, the Ministry of Energy is not exempt from the payment of these fees.

For the marketing of large generator systems, branch offices are normally set up. Importers also act as distributors of diesel generators and other power equipment and utilize sales forces to make personal calls on potential customers. These firms also bid regularly on MOE tenders. Since there are no specialized trade journals or technical advertising media in Iran specifically oriented toward power generation brochures and catalogs combined with personal contacts are the normal sales approaches.

## COMPETITIVE POSITION OF U.S. SUPPLIERS

Ten U.S. companies are selling power equipment and systems on a regular basis.

In sales of gas turbines, diesel generators and large thermal power plants, U.S. suppliers have the leading technology and have found immediate market acceptance. U.S. suppliers of power transmission and distribution equipment do not enjoy the acceptance and reputations of the larger power plant makers, and competition is very keen among all foreign suppliers. U.S. firms often have a difficult time in competing due to the availability of more competitive government export credit programs from some foreign countries. Sales of high capacity generation power plants in the near future will depend to a large extent on the ability of Iran to obtain supplier credits. Small equipment used in transmission and distribution systems does not depend heavily on supplier credits, and price is a main purchasing criterion. U.S. firms in general have been lax in the supply of needed spare parts and in meeting delivery deadlines; suppliers from other countries have been quick to exploit this.

Iranian nuclear energy planners have issued letters of intent for six plants to be purchased between 1977 and 1980 from U.S. suppliers under a U.S.-Iranian trade agreement made in 1975. These purchases, involving over \$4.5 billion, are under study by the U.S. Congress.



# Food Processing and Packaging

WHILE THE output of the Iranian food processing industry grew at an average rate of 10% annually during the years 1970–75, annual investment in food processing and packaging equipment more than tripled. It reached about \$103 million in 1975. Based in part on the increasing acceptance of processed foods by the growing Iranian middle class, an annual 12% growth rate in output is projected for the industry through 1980.

A shift in consumption patterns from traditional commodities (bread, sugar, vegetable oil) to such items as meat, dairy products, and convenience foods will mean that demand for filling and packaging equipment will be high. Most food processing equipment will continue to be imported. It is expected that canning lines for fruits and vegetables, and dairy packaging and filling equipment will be in greatest demand through 1980, when total equipment purchases by the industry are expected to approach \$200 million. The market share of U.S. suppliers in the mid-1970's was about 16%. If U.S. firms are to increase their market share, they must overcome strong competition from traditional European suppliers and intensify marketing activities. They must establish a continuous presence in the Iranian market, where long-term personal relationships are very important business assets.

## STRUCTURE AND SIZE

The food processing industry of Iran emerged as a significant part of the Iranian economy immediately following World War II. Before that time food processing was limited to traditional items such as flour, sugar, and dried fruits. In the postwar period, a variety of processed food industries such as fruit and vegetable canning, the production of vegetable shortening, beverages, and dairy products were developed. During the years 1966–76 the variety of processed foods available, either imported or produced in Iran, expanded greatly. The proportion of agricultural production which is processed increased from approximately 20% in 1965 to 38% in 1975.

The output of processed foods increased in value from \$1.6 billion in 1970 to \$2.6 billion in 1975.

This represented an average annual growth rate of about 10% (see table 1). The largest processed food industries still involve traditional products; flour, sugar, vegetable oil, confectionery, and bakery products. However, the fastest growing segments of the processed food industry during the early 1970's were spices, condiments and sauces, nonalcoholic beverages, alcoholic beverages, and processed dairy products (see table 2). Sales of products such as prepared meals, soups, baby foods, and snack items, though small in absolute amounts, were also growing rapidly by the mid-1970's.

The level of capital investment in the food processing industry expanded greatly during the 1965 to 1975 period as the industry developed from workshop level production to modern, capital-intensive processing operations. Total capital investment in the food processing industry increased from \$72 million in 1970 to \$244 million in 1975. Investment in processing and packaging equipment grew by over 80% annually from 1973 to 1975.

Iranian exports of processed foods totaled \$88 million in 1975. Major exports are dried fruits, nuts, and caviar. In addition, small amounts of vegetable oil are exported to Afghanistan and the Soviet Union, and tomato paste and vinegar are exported to the Persian Gulf countries. Exports of caviar, dried fruits, and nuts are expected to expand modestly during the late 1970's, but exports of other processed foods should not increase significantly due to projected domestic shortages of most food products in those years.

**Meat and Poultry Products.**—The processed meat industry in Iran is comparatively underdeveloped in terms of both volume and variety. Lamb and mutton (65% of total consumption) followed by beef (22%) and poultry (12%) are the main meats consumed in Iran. In 1975, only 2% of total meat output was processed. However, sales of processed meats, such as pork products, dressed broilers, and prepackaged beef cuts are growing at 30% per year, and in 1975 totaled 936 tons.

Although pork accounts for only 1% of all meat consumed in Iran, pork production is the most developed segment of the meat processing industry. There are four Iranian pork processing firms but

**Table 1.—Iran: Development of Growth Factors in the Food Processing and Packaging Industry**

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
Total Output (millions of U.S. dollars) .....	1,631	2,085	2,321	2,622	3,172	4,599
Capital Investment (millions of U.S. dollars)						
Land and Buildings .....	48.3	62.7	104.0	141.0	355.8	710
Equipment .....	23.8	31.2	58.2	102.6	132.5	207.7
Total Capital Investment .....	72.1	93.9	162.2	243.6	448.3	917.7
Number of Employees .....	92,000	99,900	108,800	117,000	122,800	153,000

<sup>1</sup> Estimates.

Source: Ministry of Industry and Mines, Bureau of Statistics and estimates based on trade interviews.

**Table 2.—Iran: Processed Food Production**

Product	1973	1974	1975	(Estimated)	
				1976	1980
Canned Fruit (thousand tons) .	25	31	36	40	52
Processed Meats (tons) .....	620	780	936	1,170	2,856
Fish (thousand tons) .....	18	19	23	26	46
Dairy Products (thousand tons) .	52	95	111	144	235
Vegetable Oil (thousand tons) .	188	235	255	275	374
Alcoholic Beverages (thousand liters) .....	40.5	47	60.5	73.8	163.6
Nonalcoholic Beverages (thousand liters) .....	140	178	242	315	899
Cookies and Crackers (thousand tons) .....	NA	45	45	55	90.5
Pasta (thousand tons) .....	10	12	15	18	37
Spices and Condiments (thousand tons) .....	2	4	5	6	12
Sugar (thousand tons) .....	700	720	650	800	1,114
Chocolates and Confectioneries (thousand tons) .....	70	90	125	138	202
Flour (thousand tons) .....	5,500	5,665	5,910	6,087	6,850

Source: Central Bank statistics, Agricultural Development Bank and trade interviews.

80% of total sales are accounted for by Arzuman Company and Mikaelian Company. These two firms produce high quality products. Both sell through a tightly controlled retail distribution system. The industry's major limiting factor is a shortage of hogs. The management of Mikaelian Company estimates that the potential demand for pork products is two to three times the 1976 market level of 96 tons per year.

The Arzuman Company, established in the 1930's, accounts for 60% of industry sales. The company has the industry's broadest product line which includes sausages, bacon, cold cuts, spare ribs, pork chops, canned meats, and sauces. The company also operates several hog farms and is the major importer of pork products and hog carcasses. Arzuman is a family-owned and operated enterprise. It relies primarily on labor intensive production methods and only basic processing equipment is utilized. Arzuman's equipment includes slicers from United Kingdom (Thompson Company), Danish (Atlas), and U.S. suppliers; vacuum sealing equipment from Germany and Italy. The company management projects that the market for processed pork products will grow at 20% to 30% annually during the late 1970's. However, the company is concerned that the shortage of hogs and the Government's tight price

control program will limit the industry's profitability and ability to expand.

The basic market for poultry in Iran is for fresh live birds. In 1975 only about 11% of total annual production of 85 million broilers was processed. Sales of dressed broilers amounted to approximately 9 million birds, of which 5 million were fresh and 4 million were frozen. Processing is done on semi-automatic lines using European equipment. There are three major companies which process broilers in Iran: Danir Company with a daily capacity of 4,000 birds, Dorafshan Company with a daily capacity of 2,500 birds and A. Aroni Company with a daily capacity of 1,000 birds. The Iranian Army also operates a broiler processing plant in Rasht, which has a daily capacity of 10,000 birds. Danir is the most modern processor of broilers and has installed a turnkey plant supplied by Peter Sprague Company of the United States. It freezes most of its output, and is the only firm which packages its products in plastic bags. Danir has its own distribution system with 14 sales outlets in Tehran.

Only a small portion of Iran's mutton and beef output is processed. The Government-owned Iran Meat Organization (IMO), organized in 1968, is responsible for importation of fresh and frozen meat and its distribution in Tehran and Esfahan. In 1974, IMO began operating its new plant for the production of packaged meat cuts with a capacity of 10 tons per day. The IMO also plans to build a dozen cold stores in major cities of Iran. East European trade agreements are being utilized to procure equipment for this project.

The Kador Company, formerly a processor of pork products, expanded to produce beef sausages in 1976. In addition, there are several small producers of beef patties which sell to supermarkets, restaurants, and the rapidly growing number of fast food shops in Iran.

**Dairy Products.**—In 1976 there were 11 pasteurizing plants operating in Iran. Seven of the plants are owned by the private sector and four are owned by the Government. Traditional products such as yoghurt and white cheese ("feta") represent the major portion of processed dairy product consumption. In 1974, processed dairy product consumption was



200,000 metric tons of milk, 485,000 tons of yoghurt, 23,000 tons of butter, 98,000 tons of cheese and 145 tons of cream. However, only 8.6% of total milk products are produced by commercial operations. Iran imports large quantities of cheese, butter, also powdered milk which is reconstituted in pasteurizing plants, much for distribution to the school milk program. Sales of nontraditional dairy products such as butter, cream, and ice cream are the most rapidly growing. During the years 1973-76 imports of cheese, formerly prohibited, grew at an annual rate of 80%.

Iran's largest pasteurizing plant is the government pasteurizing milk company in Tehran (Tehran Milk). It has a capacity of 500 tons of raw milk per day. The "Tetrapak" irradiated packaging process from Tetra Pak International AB. of Sweden is used for a portion of its milk production. Pak Dairy Company (Sherkat Sahami Labaniat Pak), a private company also located in Tehran, has a daily capacity of 250 tons. These two companies account for 76% of the country's total production of pasteurized milk. The remaining pasteurizing plants, located in the major provincial cities, are small with daily capacities averaging 20 tons (see table 3). By 1976, most of these plants were undergoing or planning expansion of their capacities in line with the Government's plans for increasing milk production.

The most progressive producer of dairy products in Iran is Pak Dairy. Pak was established in 1964 as a joint venture between Foremost-McKesson Inc. of the United States and private Iranian investors. The company was founded and is managed by Dr. R. Frank Fisher, one of the pioneers of the modern dairy industry in Iran. Pak was the only dairy processing operation which made a profit in 1975. It produces a wide range of products including white and chocolate milk (80 tons per day), cream (4 tons per day), yoghurt (5 tons per day), butter (20 tons per day), and ice cream (25-30 tons per day). These products are packaged in various sized bottles and cartons using two Udgak Ltd. (U.K.) filling machines and paper cartons from Pure Pak a division of Ex-Cell-O Corporation of the United States. Pak owns 80 refrigerated trucks for distribution of its products throughout Iran. The company has a 20% equity position in the Sepahan Dairy which in 1976 had 1,400 milk cows, and that year Foremost-McKesson purchased 30% equity in the Iran Milk Organization which operates the Government's pasteurizing plants. Pak will provide both technical and managerial support to the Milk Organization through a technical agreement contract.

**Canned Fruits and Vegetables.**—Output of the canning industry expanded at an 11% average annual growth rate during the 1972-76 period. Canned fruit and vegetable production totaled approximately

**Table 3.—Iran: Major Processed Food Manufacturers**

		Location	Capacity Per Day (tons)
<b>Milk Plants</b>			
Tehran Pasteurized Milk Co.		Tehran	180
Esfahan " " Co.		Esfahan	48
Pak " " Co.		Tehran	35
Shiraz " " Co.		Shiraz	15
Tabriz " " Co.		Tabriz	7
Abadan " " Co.		Abadan	7
Sary " " Co.		Sary	5
Rasht " " Co.		Rasht	5
Mashad " " Co.		Mashhad	5
Kermanshah " " Co.		Kermanshah	5
<b>Canned Food Producers</b>			
Shirin Co.		Mashhad	11,000
Dashte Morghab Co.		Shiraz	2,000
Ata Canning Co.		Tehran	1,800
Karon Shargh Co.		Tehran	1,500
Shahryar Co.		Tehran	1,500
Afshoreh Co.		Shahsavari	1,440
Ayda Co.		Esfahan	1,400
Azarshahr Co.		Tabriz	1,400
Gorgan Agro Ind.		Gorgan	1,300
Vita Co.		Tehran	1,200
Shahd Co.		Mashhad	1,100
Shemshad Co.		Tehran	1,000
Shadab Co.		Mashhad	1,000
Meykhosh Co.		Mashhad	750
Gholshad Co.		Mashhad	550
Mahnaz Co.		Mashhad	550
Montaz Co.		Mashhad	550
Behdasht Co.		Esfahan	550
Morad Co.		Tehran	500
Otaniyan Co.		Tehran	500
Talar Co.		Mazandaran	200
Ozra Nafici Co.		Tehran	130
Metropol Canning Co.		Tehran	100
<b>Cookie Producers</b>			
Various workshops		Tehran	23.3
Sherkat Sanati Pars (Minoo)		Tehran	20
Vitana Co.		Tehran	18
Gorji		Tehran	11.6
Nan Sita		Tehran	6.6
Hemayat Madaran		Tehran	2
<b>Candy and Confectionery Producers</b>			
Dadashzadeh Co.		Tehran	32
Kayvan Company		Tehran	26
Pars Minoo Co.		Tehran	26
Dadash Va Baradar Co.		Tabriz	15
Vitana Biscuit Co.		Tehran	12
Ali Nejati Co.		Tabriz	9
Shanjan Company		Tehran	7
Fard Shirin Company		Tehran	7
Fard Kanavan Company		Tehran	2
Solaymanzadeh Co.		Tabriz	2
Mr. Mansoubi		Kermanshah	2
Mr. Kyanifar		Mashhad	2
Skokomars Co.		Tehran	7
Sherkate Sahami Sanati		Tehran	3.8
Saveh Co.		Tehran	1.5

Source: Ministry of Industry and Mines and trade interviews.

36,000 tons in 1975. The wide range of fruits and vegetables canned in Iran includes tomatoes, pickles, peas, beans, cherries, apples, apricots, and pears. Tomato products such as tomato paste, catsup, and whole tomatoes account for 35 to 40% of total production of the canning industry. Canned fruits represent approximately 30% of total production. In

1975, there were 40 canneries in Iran. However, many of these producers were extremely small or had just been organized, and 20 major producers produced more than 90% of total output that year.

The leading canning company in Iran is Dashte Morghab Company which markets 35 products including a complete line of vegetables, jams, and prepared foods, under its popular "yek-o-yek" label. Dashte Morghab grows 80% of its raw material requirements on 900 hectares of farmland in Fars province, and markets its output through a nationwide distribution system. Split equally between Tehran and the provinces, approximately 70% of Dashte Morghab's sales are made in supermarkets. The remainder of production is sold to a large number of restaurants and commercial food operations.

Dashte Morghab has been a pioneer in the development of the Iranian canning industry through a variety of creative corporate activities. These range from the provision of extensive technical support for its contract growers to intensive multimedia advertising of its products. During the 1970's the company's high quality products and marketing activities stimulated demand for canned vegetables in Iran. In 1976 the company expanded and diversified its activities by purchasing a tomato paste cannery in Azerbaijan and Kador Company, a producer of meat products.

Dashte Morghab employs machines and technology primarily obtained from Germany and other European suppliers. In 1976 the firm installed a 40 ton per day tomato paste line purchased from T. Manzini & Figli S.a.S. of Italy. Dashte Morghab imports most of its cans from European suppliers and its can lines consist only of fillers and top seamers. In addition, a number of foreign technical experts are employed to maintain consistent quality and taste standards throughout the whole product line.

In the mid-1970's the scope of the Iranian fruit and vegetable processing industry was broadened by the establishment of several producers of canned orange juice, two vegetable dehydration companies, and a frozen foods company. Production of canned orange juice should grow rapidly, increasing from 200,000 liters in 1975 to 500,000 liters by 1980. Two companies, Talaar Co. and Afshoreh Co., using predominantly Italian machinery, accounted for 85% of the 1975 orange juice production. Dried vegetables such as parsley, onions, garlic, and a variety of herbs are canned and packaged by Piazar Compay and EDKA, an army-owned company which produces dehydrated vegetables for both army consumption and the retail market. In 1976 there was only one frozen food producer, Pichak Company, which started producing frozen potatoes, carrots and green beans in 1975. Pichak also is the leading sup-

plier of frozen hamburger patties in Iran and has two large capacity (10,000 per hour) patty forming machines from Hollymatic Corp. of the United States.

**Grain Milling.**—Production of flour and traditional breads is the largest segment of the Iranian food processing industry. The production of flour in 1975 was 5.9 million tons with flour production growth 3% per year in the mid-1970's. There are thousands of small flour mills throughout Iran, but more than 90% of commercial flour production is accounted for by 21 modern flour mills in the Tehran area. Equipment from the U.S.S.R. and Eastern Europe predominates in the industry. The largest of these flour processors is Sherkat Karkhaneh Ard-e Iran, with a daily capacity of 140 tons of flour. Flour is normally packed by locally produced semiautomatic machinery in polypropylene bags.

**Bakery Products.**—In Tehran, several types of traditional Iranian breads are produced by 3,062 small bakeries. Though several businessmen own 20 or more bakeries, most bakeries are owned and operated as individual proprietorships. In 1976 there also were 16 modern bakeries in Tehran, producing approximately 32 tons of European types of breads and rolls daily. Totak Company, which is a small packaged bread producer, uses mixers, ovens, and molding machinery from Werner & Pfleiderer GmbH of West Germany and cutting machinery from Italian suppliers.

The production of cookies and crackers expanded from 22,000 tons in 1970 to 45,000 tons in 1975 and industry output is expected to grow about 15% annually through 1980. Cracker production is dominated by three large companies which account for 70% of annual production: Biscoperse Company, Minoo Industrial Company, and Vitana Company. The remaining 30% of output is produced by several small companies and more than 200 workshop producers. The cracker production of the three major companies is well packaged and intensively marketed, and the firms compete aggressively for shelf space in grocery shops and supermarkets. Minoo, the largest producer, uses mixing equipment and ovens from Baker Perkins, Ltd. (U.K. subsidiary of the American firm), and confectionery/biscuit molders and packaging equipment from Germany.

**Pasta products.**—In the mid-1970's there were 16 pasta manufacturers in Iran, mostly located in the Tehran area. Their major products were vermicelli-type noodles for soup and spaghetti. The two largest companies in the field are *Tigalco* (brand names Napoli and Tigal), which produced an estimated 3,600 metric tons of pasta products in 1975, and has a 23% share of the market; and *Macaro Co.* (Yumbo brand), producing an estimated 1,900 tons



in 1975, to account for a 13% market share. All packaging in the industry is still done by hand. Pasta-making equipment used in Iran is either Italian or locally fabricated copies of Italian machines.

**Animal Feeds.**—In 1975 Iranian production of processed animal feed totaled approximately 200,000 tons of broiler and 65,000 tons of layer feed. About 50% of feed production was accounted for by five companies: Pars Company, Daneh Daran Company, Provimi Company, Miraneh Company and the Army feed plant. The feed mills operate at 35% to 40% of their rated capacities due to severe shortage of feed ingredients, most of which are imported, and competition from small feed mixers and mills operated by poultry farmers. The feed producers in Iran generally produce low quality feeds which are not clean, often do not adhere to listed specifications, and are not regularly available. Consequently, poultry producers have increased their purchases of imported feed which is mixed with local products.

**Sugar and Confectionery Products.**—In 1975, annual consumption of sugar in Iran was approximately 900,000 tons. Domestic sugar production amounted to 700,000 tons, of which 600,000 was produced by 32 sugar beet factories and 100,000 was produced by the Haft-Tappeh Sugar Cane project in Khuzistan. Beet sugar production technology is primarily obtained from the U.S.S.R. and Eastern Europe. A Liberian subsidiary of I.U. Industries of the United States was consultant for the development of the Haft-Tappeh project. In addition, Iran imported 200,000 tons of sugar in 1975. The 5–6% annual growth in sugar demand has been spurred by a 10 to 12% growth in sugar use in confectioneries, canned fruits, and other processed foods.

During 1973–75 output of the confectionery industry grew at an average annual rate of 34%, and in 1975 the production of confectionery products such as chocolates, candies, and chewing gum amounted to 125,000 tons. Six companies manufacture chocolates in Iran. The largest firms, Shocomars Company and Minoo Industrial Company accounted for 40% of the total 1975 production of 17,000 tons of chocolates. These firms rely heavily on formulas and technical expertise obtained through license agreements with European companies such as Mackintosh & Mackintosh Ltd., Rowntree Mackintosh Ltd. and Cadbury Schweppes Ltd. (all U.K.).

**Fats and Oil Processing.**—The consumption of vegetable oil in Iran rose from 180,000 tons in 1973 to 255,000 tons in 1975. Approximately 80% of the raw material for vegetable oil production is imported. There are 14 producers of vegetable oil four of which (Behshahr Industrial Group, Pars, Jahan Co. and the Iranian Army) dominate the in-

dustry and account for 80% of production. Each of the private companies markets several brands of vegetable shortening through well-developed marketing organizations. Together they have 18 factories which only refine raw oil. Both oilseeds and raw oil are imported for further processing. The large companies also own cotton gins. Filling and packaging equipment appears to come mainly from Germany, Japan, and the United States. Leading firms in this field are Pneumatic Scale Corp. (U.S.) and BEKUM-Berliner Kunststoff-Verarbeitung GmbH (Germany).

The major raw material sources of vegetable oil in Iran are cottonseeds, soy beans, and sunflower seeds. During the late 1960's the major vegetable shortening producers formed the Oil Seed Cultivation and Development Company (OSDC) with the objective of encouraging farmers to expand and improve the cultivation of various oilseed crops. OSDC provides the farmers with technical and financial support and during the mid-1970's was partially successful in introducing the cultivation of soybeans in the Caspian area.

In the mid-1970's the large vegetable oil companies were purchasing equipment to increase their processing capacity by approximately 30 to 40%, with the objective of making Iran self-sufficient in vegetable oil production. However, due to the persistently low yields of soybeans and a projected reduction in cotton hectareage, it is doubtful that local oilseed production will keep pace with processing capacity.

Several foreign and Iranian companies have considered the production of corn oil in Iran. However, the small corn hectareage and the difficulty of introducing a new crop such as corn has convinced these potential investors that such a project is not feasible.

**Beverages.**—Production and consumption of alcoholic and nonalcoholic beverages is growing rapidly in Iran. Carbonated soft drink production totaled 810 million bottles in 1975. Cola, orange, and lime and other flavored drinks accounted respectively for 58%, 36%, and 6% of sales that year. All soft drinks produced in Iran are sold in bottles. Cans, nonreturnable bottles, and vending machines are not expected to become important means of soft drink distribution until the 1980's. Soft drink consumption grew at an annual rate of 25% during the 1974–76 period and it is projected that this growth rate will continue through 1980.

Two companies, Sasan Company and Zam Zam Company, control most of the 21 bottling plants in Iran. Sasan, which began operations in 1956, holds the Iranian franchise for Coca-Cola, 7-Up, and Canada Dry and accounts for approximately 55% of total soft drink sales. The company employs over 400 salesmen. Zam Zam holds the franchise for

Pepsi-Cola and Schweppes. A company associated with Zam Zam (Mina Glass Co.) manufactures glass bottles and operates several plants, the largest of which has a capacity of 1,250 cases of bottles per hour. All equipment used in the soft drink industry comes from George J. Meyer Company of the United States.

In 1975, five companies produced 120 million bottles of beer in Iran. These companies are Shams Brewery Company, Iran Malta Company, (SKOL), Argo Company, Madjidieh Company and Bilassu Company (STAR). The beer market grew rapidly at an average annual rate of 17% between 1970 and 1974. An innovation in the industry was the introduction by Iran Malta (SKOL) of beer in cans in 1974. The cans (already printed) are imported from National Can-Greece, A.B.E. division of National Can Corp., (U.S.) and bottle labels are imported from IMEHOF GmbH of West Germany. The fermentation plant was installed in 1968 and uses West German equipment from C. Seeger GmbH and Steinecker GmbH, with all refrigeration equipment from Nall-Thermotank Ltd. of the United Kingdom.

In 1974, alcoholic beverage production consisted of 7.2 million liters of vodka; 2.9 million liters of arak (a local spirit similar to vodka); 1.2 million liters of cognac; 1.2 million liters of liqueurs, and 1.1 million liters of wine. There are eight producers of vodka in Iran; the largest are Iran May Company,

Ettehadieh Company, Pakdis Company and Iran Beverage Ararat Company. Several of the vodka producers have developed export sales to Europe and Asia.

The wine industry experienced an extremely rapid growth in the early 1970's. The output of wine increased from 18,000 liters in 1970 to approximately 1.5 million liters in 1975. The major domestic producer is Pakdis Co. which markets several types of white, red, rosé and sweet dessert wines. Pakdis processes local grapes in a modern plant (located in the western Rezaieh district) with 4 million liter annual capacity. The Pakdis operations was begun with considerable technical advice from French experts. Other wine producers are Iran Bakhtar, Iran Beverages and Meykadeh.

**Fisheries, Fish, and Seafood.**—The production and marketing of all fish products is controlled and regulated by two Government-owned corporations. The Northern Fisheries Co. controls the catch on the Caspian Sea and produced over 4,00 tons of various fish and 200 tons of caviar in 1975. The Southern Fisheries Co. controls the fishing along the Persian Gulf and in 1975 over 3,000 tons of shrimp and 12,000 tons of fish including tuna and sardines were caught in the Gulf. Southern Fisheries operates a canning plant in Bandar Abbas. Production in 1975 was 2.5 million cans of tuna fish, 500,000 cans of sardines, and 200 tons of fish meal. The company



*Northern Fisheries Company workers hauling in sturgeon nets.*



also operates freezing and cold storage facilities at five Persian Gulf ports. The fishing fleet of the Southern Fisheries in 1976 consisted of 36 vessels 78–110 feet in length.

The Northern Fisheries operates three fishing docks at the port of Bandar Pahlavi and two at the port of Bandar Shah. In 1976 Northern Fisheries had five ships with a 30-ton capacity and five refrigerated ships with a 110-ton capacity, all purchased from the U.S.S.R. Additionally there were 10 smaller ships of 5–8-ton capacity. In 1974 the Government established the Jask Fishing Company located in the town of Jask. This plant will be used to process, can, and freeze whitefish and mullet caught in the Caspian Sea. There are also seven private fish farming projects that have begun spawning operations in the Caspian area since 1974.

**Tobacco Production.**—The Iran Tobacco Company, formed in 1934, has exclusive control of all tobacco growing and cigarette manufacturing. The company has two cigarette plants and sold 35 billion cigarettes in 1975. In 1969 Iran produced 11 brands, but local cigarette production is decreasing because of consumer preference for American-style cigarettes. Iran Tobacco has several licenses to produce foreign brand cigarettes. The firm has agreements with Philip Morris Inc. (U.S.) to produce Marlboro cigarettes, and with the R. J. Reynolds Tobacco Co. (U.S.) to manufacture Winston cigarettes. In 1975 domestic production of cigarettes amounted to an estimated 18 billion, the rest were imported from the United States and tax stamped in the country.

**Other Food Products.**—In the mid-1970's annual per capita tea consumption in Iran was estimated at 1 kg. Domestically grown dried tea (approximately 23,000 tons in 1975) is blended with imported tea (approximately 9,000 tons) mainly from Sri Lanka and India. The most important tea companies are Golestan Tea Co., Djahan Tea Co., and Oghah Tea Co., all of which distribute nationally through commission agents in Tehran and major provincial towns.

Salad dressing and mayonnaise production was estimated at 400 tons in 1975, with Mahran Co. the leading producer. Mahran owns the only domestic vinegar producer, Varda Co., which produced 1.5 million liters of vinegar in 1975. Mahran also packs olives and was processing approximately 20 tons per year in the mid-1970's. Some other companies in the field of condiments and spices are Arzuman Meat Processing Co. which manufactures mustard and MHH Co. which bottles some spices and herbs under the Saviz label.

The processing and packing of nuts, a popular snack food in Iran, is dominated by the Government-

controlled Iranian Pistachio Co., while the most important private-sector company is Jiroft Agro-Industry. In the mid-1970's these companies and other smaller firms were processing approximately 20,000 tons of pistachios, 20,000 tons of almonds, and 13,000 tons of other nuts per year.

**Principal Government Offices.**—There are a variety of government organizations which play an important role in the processed food industry. The Department of Agribusinesses and Meat and Dairy Complexes of the Ministry of Agriculture oversees the planning and formation of large government and private food processing projects. The Agricultural Development Bank of Iran (ADBI) provides long-term loans to finance agricultural projects. ADBI provides approximately 85% of the long-term credit for new processing companies. ADBI will provide up to 60% of the capital requirements of new food processing operations formed in the country.

The Ministry of Industry and Mines located on Ark Square near the central bazaar in Tehran reviews applications for manufacturing and processing operations. The Ministry of Commerce also plays a critical role in the development of the food processing industry. This ministry supervises the operation of the school lunch program and through its subsidiary company, the Foreign Transactions Company, is responsible for the importation of most foodstuffs including meat, frozen chicken, wheat, tea, sugar, vegetable oil, milk powder, cheese, eggs and other products. The Institute of Standards and Industrial Research (ISIRI), which is also a part of the Ministry of Commerce, sets quality standards for contents and packaging of processed foods. The Ministry of Commerce also sets retail prices of processed foods which are enforced by the Ministry's Price Intelligence Center. The Ministry of Health sets health and sanitation standards for food processing factories. The Health Ministry also tests and issues permits for all new food products.

## TRENDS, PROGRAMS, AND PROJECTS

The production value of processed foods in Iran grew 10% annually during the period from 1972 to 1975, compared with an annual growth rate of 4–5% for agricultural production during the same period. The comparatively high growth rate for processed foods resulted from growing demand stimulated by profound changes in the Iranian economy and government policies supporting processed foods production.

The recent rapid growth in disposable personal income has provided a significant percentage of Iranian families with income levels which allow substantial purchases of processed foods such as dairy



products, canned vegetables, and processed meats. Between 1962 and 1972, the percentage of the urban population which could be defined as the Iranian middle class (in terms of annual income) increased from 31% to 57% while the percentage of rural inhabitants in the middle class increased from 18% to 25% during the same period.

In the late 1960's and early 1970's, the growing number of Iranians with foreign educations or travel experience resulted in an increase in demand for western-type processed foods. The large foreign community in Tehran also contributed substantially to the consumption of processed foods. These trends in consumer preferences and income levels are reflected in the rapid growth in the number of supermarkets in Tehran, from three stores in 1965 to 25 stores in 1975. Supermarket sales accounted for 3-4% of total food purchases in Tehran in 1975, and sales in these stores are growing at 25% to 30% per year.

The processed food industry has benefited from an import protection policy. For example, the importation of most canned fruits and vegetables and soft drinks is unauthorized. The combination of customs duties and surcharges on those canned goods which can be imported such as prepared foods, soups, macaroni, and breakfast cereals range from 35% to 400%, ad valorem (based on C&F). However, during the mid-1970's the restrictions and duties on many processed foods were either eliminated or liberalized. In fact, due to severe shortages of most food products, the Iranian Government is importing large quantities of processed foods. This may result in lower profits and less investment in the Iranian food processing industry.

The most important constraint to more rapid expansion of processed foods in Iran is an inadequate supply of raw materials. A variety of producers of processed foods have market opportunities and processing capacities which substantially exceed the volume of available raw materials. This situation is particularly true for tomato paste canners, the pork products industry, vegetable oil producers, and the vegetable dehydration companies. Officials in the Ministry of Agriculture have stated that future applicants for food processing operations will be encouraged or required to integrate backwards into farming to assure a supply of raw material. This policy may discourage new investment in processing because of the comparatively low profitability and high risk associated with farming in Iran.

The combination of a growing demand for food and the substantial shortages of agricultural produce and processed foods in Iran is likely to force the Government to permit a wide range of food imports on liberal terms. The supply of food products at competitive world prices may further discourage investment in agriculture and food processing. For ex-

ample, the shortage of hogs for pork processors caused the Government to grant permission for the importation of hog carcasses from Europe. The price of imported hogs is substantially lower than the price paid for local hogs. Thus the major hog producers have hesitated to expand their production because they fear importers will undercut them.

During 1975 the Government, through the Ministry of Commerce, implemented a comprehensive and well-enforced price control program. Wholesale and retail prices were set for 250 food items. The effect of price controls on profitability and investment in food processing is not yet clear. However, when a large canning company implemented a new cost accounting system and discovered that many of its products were priced below production costs, it took the company 1 year to receive approval for moderate price increases. Moreover, during 1976, several potential foreign investors decided not to invest in livestock and vegetable canning projects because they felt the Government's price control levels severely inhibited the profitability of the planned projects.

Finally, an important constraint on the rapid and successful development of food processing in Iran is the failure of foreign food companies to invest in Iran's agriculture and food industry. The increasing sophistication of Iran's processed food industry will require the transfer of modern food processing techniques and management. One of the best means of implementing such transfers is the direct involvement of foreign food companies in project ownership and management. To date, foreign food companies have preferred to limit their involvement in Iran to exclusive distribution or licensing agreements with local firms. Foreign companies have investigated an array of joint venture food manufacturing projects but by January 1977 none of these investigations had resulted in investments. A government policy adopted in 1975, which will distribute 49% of equity shares in major companies to employees and the general public, will ultimately limit the equity position of foreign investment in food processing to 15 to 25%. This policy has also discouraged foreign investors who often feel they need a larger equity share to justify their involvement.

The Government's Fifth Development Plan identifies agriculture as a priority area for national development, and total investment credits for agriculture are programmed at \$12 billion during the 5-year Plan period. The projected growth for processed foods output is 11%, but is expected to grow at about one-half that rate during the 1975-80 period. However, the Fifth Plan does not contain specific programs for the development of the food processing industry. The planners believe that the Government's programs should concentrate on the expansion of



farm output as a source of raw material which will enable the food processing industry to continue its high growth rate of the early and mid-1970's and attract private capital.

A specific objective of the Fifth Plan is to develop rural processing industries to provide employment for surplus labor created by the expansion of mechanized agriculture. The Ministry of Agriculture is undertaking the planning and construction of a variety of processing enterprises to be managed by the farm corporations and production cooperatives. The projects which are being considered for the next few years include dairies, tomato paste canning plants, small-scale slaughter houses, cold storage plants,

small flour mills, olive oil plants, ice plants, orange juice plants, potato chip factories, rice packaging plants and a variety of other small-scale projects (see table 4). These projects are being developed with technical support and equipment from Yugoslavia, Bulgaria and Romania.

The fixed government price for flour and bread, rising costs of labor, and the small production output of the neighborhood bakeries has rendered many of these bakeries unprofitable. Because bread accounts for 70 to 75% of the nutritive intake of low income Iranians, the Government has consistently maintained a low, fixed price for bread. Given the national importance of the price of bread and the low

*Table 4.—Iran: Approved Food Processing Plants<sup>1</sup>*

Type of Project	Organization	Est. Completion Date	Remarks
Refined Sugar .....	Karoun Sugar Cane—Ministry of Agriculture	1980	Part of integrated agribusiness at total cost of \$100 million
Slaughter houses, cold stores, beef, sugar refinery, animal feed processing.	Moghan Agribusiness Project—Ministry of Agriculture	1978	Part of integrated agribusiness at total cost of \$100 million
Citrus fruit juices, packaged vegetables ....	Jiroft Agro-business Complex—Government and private	1981	Part of integrated agribusiness at total cost of \$28.5 million
Beef cattle, dairy, pasteurized milk .....	Mazandaran Meat and Milk Complex—private	1979	Part of integrated agribusiness at total cost of \$24.1 million
Beef cattle, pasteurized milk .....	Alvand Dairy and Farming Co.—private	1980	Part of integrated project at total cost of \$17.7 million
Mechanized bread factories .....	Iran Baker's Federation—Government	1977	Cost: \$16 million for 14 plants
Milk production plants .....	Iran Dairy Industry—Government	1978	Cost: \$15.1 million covering 11 plants
Chicken rendering facilities .....	N. A.	1977	Cost: \$7.7 million; 4,000/day capacity; contract signed with Bulgaria and Yugoslavia
Tomato paste, dairy cattle .....	Alemtals Dairy and Agri-business Co.—private	1981	Cost: \$7.1 million
Pasteurized milk .....	Gonbad Milk Pasteurizing and Sterilizing Co.—private	1978	Cost: \$4.3 million
Cigarette plants .....	Iran Tobacco Monopoly Organization—Government	1978	Cost: \$4.08 million for 2 plants
Beef cattle, pasteurized milk .....	Piraghom Milk and Meat Complex—private	1978	Cost: \$3.9 million
Cold storage facilities .....	Iran Meat Organization—Government	1977	Cost: \$3.7 million
Cold storage facilities .....	Iran Fisheries Organization—Government	1977	Cost: \$3.4 million
Tomato Paste .....	Gorgan Agro-Industrial Co.—private	1977	Cost: \$2.5 million
Tuna Canning Line .....	Southern Fisheries Co.—Government	1978	Cost: \$1.3 million
Yoghurt .....	Mecca Bazargani Co.—private	1977	Cost: \$1.0 million
Dairy and pasteurized milk .....	Jahanfar Milk Complex—private	1979	Cost: \$700,000
Tomato paste plant .....	Ministry of Agriculture and Rural Affairs	1979	Cost: \$518,000
Dairy, beef, sugar .....	Austiran—Ministry of Agriculture	1979	Cost: N. A.
Meat packaging plant .....	Iran Meat Organization—Government	1977	Cost: N. A.; 50 tons/day capacity
Bottling plant (dough) .....	Araj Company—private	1978	Cost: N. A.
Pickle processing plant .....	Chin-Chin Co.—private	1977	Cost: N. A.
Five Milk Plants .....	Iran Dairies Corp.—private	1978	Cost: N. A.; contract let to Alfa-Laval
Lemon juice plant .....	Mekhshesh Co.—private	1977	Cost: N. A.; 900 tons/day capacity
Date packaging plants .....	N. A.	N. A.	Cost: N. A.; 3 plants in Southern Iran
Flour plants .....	N. A.	1979	Cost: N. A.; agreement with Romania for 5 plants
Honey packaging plant .....	N. A.	N. A.	Cost: N. A.

<sup>1</sup> This table has been compiled on the basis of information released by the Ministry of Agriculture, the Ministry of Industry and Mines or ADBI. Many of the projects listed are part of larger agricultural development projects. Some listed projects may be deferred considerably due to delays in the overall projects, and some may be abandoned completely.

Source: Ministry of Agriculture, Ministry of Industry and Mines, Agricultural Development Bank of Iran and trade interviews.

profitability of the small bakeries, the Government has undertaken a program to mechanize the production of traditional breads. Through the Tehran Cooperative of Bakers, the Bread Mechanization Project completed five mechanized bakeries and will complete an additional 10 bakeries by the end of 1977. The machine-made bread is presently sold to institutions such as hospitals, schools, and the military. The special machinery required to produce the traditional bread has been imported from West Germany, Romania, France, and Britain. The German bread-making equipment has proven to be the most successful. If the initial 15 bakeries are successful the Government plans to expand the project to 150 bakeries in Tehran and provincial cities.

The Government is also investing directly in agricultural production through several large-scale government "agribusiness" companies (see *Agro-Industry* chapter). Most of these projects will eventually involve food processing operations.

The private agribusinesses in Khuzistan and other areas of Iran have generally not invested in food processing operations. However, the private companies Jiroft Agro Industry Co., Gorgan Agro Industry, and Mehrazin Agro Industry are planning large-scale fruit and vegetable canning projects. In 1976 the Ministry of Agriculture's Department of Agribusinesses and Meat and Dairy Complexes was studying applications from private investors for approximately 145 food processing projects. The projects include 60 cold storage facilities, six fruit and vegetable canneries, six tomato paste plants, several slaughterhouses, three poultry processing projects and a variety of other projects. However, it is unlikely that more than 40 to 50 of these projects will begin production before 1981.

## GROWTH PROSPECTS

Production of processed foods is expected to grow at an average annual rate of 12% between 1975 and 1980. The economic, cultural and governmental factors which spurred growth in the demand for processed foods during the early 1970's will accelerate during this period. During the late 1970's, middle and upper income families in Tehran and major provincial cities will remain the basic market for most processed foods. However, the market will slowly broaden to include lower income groups as well. The expansion of the Urban and Rural Cooperative Stores from 400 to 1,000 units during the late 1970's will expose lower income consumers to a variety of processed foods. Moreover, beginning in the early 1980's, the expected growth in the incomes of rural inhabitants should lead to an increase of processed food use by this group.

During the years 1976-80, the Iranian shift in consumption patterns from traditional commodities such as bread, sugar, and vegetable oil to high protein foods such as meat and dairy products and convenience foods will accelerate. During the same period growth in production of traditional processed commodities is expected to slow down. Annual growth of sugar and vegetable oil production should be 10% and that of flour, 3%. Output of processed meat, dairy products and canned foods is expected to expand at 25%, 20%, and 10% annually respectively. Growth of milk and processed dairy products will be stimulated by the Government's school lunch program, and the program's purchase of biscuits and lunch snacks will also spur growth of the biscuit and snack industry.

The production of beverages and convenience foods such as soft drinks, beer, prepackaged meals, soups, and baby food will grow at rates of between 20% and 30% per year. The high growth of convenience and specialty foods will result from both a rise in demand for existing products and the introduction of new products to the Iranian market. The output of potato chips should grow rapidly from the 1976 level of 400 tons per year as several new projects with automated production processes come on stream. Sales of dehydrated vegetables are expected to grow at a rate of 15% annually. Frozen foods production will probably not achieve high levels before 1980 because of the inadequate freezing facilities from factory to home freezer, inadequate supplies of the high quality raw produce required for frozen food processing, and the relatively high cost of production.

Output of broilers and eggs is projected to grow at 14% during the late 1970's. The feed millers will enjoy a similar growth rate only if they are able to improve the quality of their feeds and assure sources of raw materials at profitable prices.

## CAPITAL GOODS MARKET

Total sales of capital equipment to the Iranian food processing industry increased from \$27.9 million in 1973 to over \$101 million in 1975 (see table 5). It is expected that the total demand for this equipment will grow at 14% per year and amount to nearly \$200 million in 1980. Domestically manufactured equipment is estimated to amount to less than 10% of total sales in 1980 and the balance will be satisfied by imports.

Over one-fourth of demand is estimated to be for filling and packaging equipment, while general food processing machinery is expected to make up about 44% of total demand by 1980. Ovens and other heating and cooling equipment, which in 1975 ac-



**Table 5.—Iran: Size of the Market for Food Processing and Packaging Equipment**  
(thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>PACKAGING AND FILLING EQUIPMENT</b>					
Domestic Production .....	—	—	20	70	400
Imports .....					
United States .....	783	2,411	3,819	4,370	7,300
United Kingdom .....	311	513	2,047	—	—
West Germany .....	1,595	4,569	11,720	—	—
Italy .....	515	1,163	3,190	—	—
Sweden .....	91	79	2,005	—	—
Others .....	1,525	2,279	7,057	—	—
Total .....	4,820	11,014	29,838	35,805	52,400
Exports .....	—	—	—	—	—
Total Market .....	4,820	11,014	29,838	35,875	52,800
<b>FOOD REFRIGERATION EQUIPMENT</b>					
Domestic Production .....	2,370	3,740	5,670	6,700	8,900
Imports .....	—	—	—	—	—
United States .....	1,380	2,970	4,306	4,070	6,300
West Germany .....	151	457	571	—	—
Italy .....	180	398	497	—	—
Denmark .....	109	296	372	—	—
Others .....	510	574	1,061	—	—
Total .....	2,330	4,695	6,807	8,170	16,900
Exports .....	40	180	390	360	1,800
Total Market .....	4,660	8,255	12,087	14,510	24,000
<b>MECHANICAL HANDLING EQUIPMENT <sup>2</sup></b>					
Domestic Production .....	—	—	—	—	—
Imports .....					
United States .....	962	1,291	1,730	2,260	2,900
West Germany .....	847	2,018	2,345	—	—
United Kingdom .....	433	940	1,270	—	—
Italy .....	260	563	710	—	—
Japan .....	275	637	1,130	—	—
Others .....	750	1,654	3,469	—	—
Total .....	3,527	7,103	10,654	13,850	20,700
Exports .....	—	—	—	—	—
Total Market .....	3,527	7,103	10,654	13,850	20,700
<b>NONDOMESTIC FOOD MACHINERY <sup>3</sup></b>					
Domestic Production .....	—	27	130	350	1,300
Imports .....					
United States .....	133	551	2,371	3,080	6,400
West Germany .....	1,209	4,203	9,462	—	—
United Kingdom .....	968	2,919	4,505	—	—
Eastern European Countries .....	333	5,189	1,768	—	—
Others .....	1,425	755	5,313	—	—
Total .....	4,068	13,617	23,419	30,350	44,400
Exports .....	—	—	—	—	—
Total Market .....	4,068	13,644	23,549	30,700	45,700
<b>HEATING &amp; COOLING EQUIPMENT <sup>4</sup></b>					
Domestic Production .....	570	620	690	1,130	3,500
Imports .....					
United States .....	308	490	776	2,050	2,300
West Germany .....	778	1,076	1,270	—	—
United Kingdom .....	773	768	833	—	—
France .....	487	321	446	—	—
Others .....	624	760	773	—	—
Total .....	2,970	3,415	4,098	5,420	10,200
Exports .....	—	—	—	—	—
Total Market .....	3,540	4,035	4,788	6,550	13,700
<b>OTHER PROCESSING EQUIPMENT AND PARTS <sup>5</sup></b>					
Domestic Production .....	380	700	820	1,020	3,700
Imports .....					
United States .....	851	415	2,171	3,400	4,900
West Germany .....	4,062	4,529	9,923	—	—
United Kingdom .....	425	1,022	2,208	—	—
Italy .....	712	830	1,880	—	—
Others .....	849	2,248	3,718	—	—
Total .....	6,899	9,044	19,900	22,885	39,000
Exports .....	—	—	—	—	300
Total Market Size .....	7,279	9,744	20,720	23,905	42,400

**Table 5.—Iran: Size of the Market for Food Processing and Packaging Equipment—Continued**  
(thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>TOTAL FOOD PROCESSING AND PACKAGING EQUIPMENT MARKET</b>					
Domestic Production .....	3,320	5,087	7,330	9,270	17,860
Imports .....					
United States .....	4,417	8,128	15,173	19,230	30,100
West Germany .....	8,642	16,852	35,291	—	—
United Kingdom .....	2,910	6,162	10,863	—	—
Italy .....	1,667	2,954	6,277	—	—
Others .....	6,978	14,792	27,112	—	—
Total .....	24,614	48,888	94,716	116,480	183,600
Exports .....	40	180	390	360	2,100
Total Market Size .....	27,894	53,795	101,656	125,390	199,300

<sup>1</sup> Estimates.

<sup>2</sup> Conveyor lines which include overhead conveying systems, forklift trucks.

<sup>3</sup> Includes vegetable processing lines, fruit sorting equipment, and other food processing systems.

<sup>4</sup> Equipment that involves temperature change such as ovens, autoclave, homogenizers, and sterilizers.

<sup>5</sup> Including slicers, dicers, grinders, mincers, blenders, cutters, and small extrusion machinery and parts.

Source: United Nations, Organization for Economic Cooperation and Development, supplier country and official Iranian trade statistics; estimates based on trade interviews.

counted for less than 5% of all equipment demand, are projected to rise to nearly 7% of the 1980 market owing to an increase in more advanced food processing operations.

## Imports

Between 1974 and 1975, total Iranian food processing and packaging equipment imports almost doubled in value, rising from \$49 million to nearly \$95 million. West German suppliers lead in sales of all categories other than refrigeration equipment, and furnish Iran with 37% of all imports of food machinery. West German suppliers' sales of filling and packaging equipment are especially strong. It is expected that because of monetary revaluations, the rising prices of German equipment will reduce the West German suppliers' share of the total import market by 1980. Despite this expected decline, West German suppliers should continue to lead all foreign suppliers through 1980. In 1975, U.S. firms supplied about 16% of equipment imports. American suppliers were strong in sales of mechanical handling and cold storage refrigeration equipment, but only furnished slightly over 10% of the processing, filling, and packaging equipment requirements that year. Due to increased competition from other suppliers, U.S. firms, while selling a greater dollar volume of equipment by 1980, are not expected to increase their total market share appreciably. British suppliers, who accounted for just over 11.5% of 1975 imports are expected to show a steady growth in sales during the 1976–80 period and should increase their total market share by 1980. This increase should result from the very active marketing efforts being made by British firms and the 21% devaluation of British currency in late 1976.

## Domestic Manufacturing

Iranian manufacturers furnished the food processing industry with over \$7.3 million worth of equipment in 1975. This represented 7% of the total industry demand during that year. About 30% of total sales were made by Zagross Company, which is the leading Iranian manufacturer of refrigerated food cases for supermarkets and grocery stores. All other equipment furnished to the industry in 1975 was produced in small workshops on a job shop basis. Items supplied by these workshops included cooking pans, mixing bowls, utensils, and auxiliary equipment used in food processing factories. Because of the growing needs for technologically advanced equipment in the industry, it is unlikely that domestic manufacturing will represent more than 10% of total industry requirements by 1980.

## MARKETING OPPORTUNITIES

The following equipment will have good sales potential over the 1976–80 period.

**Meat and Poultry Processing Equipment.**—Increases in the consumption of processed meat products will require additional new machinery such as sausage mixing and extruding machinery, hamburger patty forming and wrapping machines, continuous cooking ovens, and refrigeration machinery. Poultry production will increase rapidly during the late 1970's and early 1980's and more chicken rendering plants will be built. In addition, vacuum packaging equipment will find a good market among smaller operators of poultry farms.

**Dairy Products.**—Thermoforming equipment for plastic containers will begin to find a strong market



in the late 1970's. Filling machinery (both semiautomatic and automatic) will be in strong demand. During the 1976-80 period a greater demand is expected to develop for packaging equipment of all kinds (e.g. butter and cheese wrappers, yoghurt containers) along with printed cartons for milk.

**Fruits and Vegetables.**—A strong demand for canning lines had developed in Iran by 1976. Products which will find a good market in the 1976-80 period will probably be linked to canning operations. Autoclaves and can seamers should be in good demand during this period. Other equipment needed in this area will be graders, bleachers, choppers and pitters, washers, bean snippers, and complete plants for making tomato paste and fruit juices, and for dehydrating vegetables.

**Grain Milling.**—There will be little demand for flour mills until 1980. Those plants that will be built will probably be part of trade agreements signed by Iran and Eastern European countries.

**Bakery Products.**—Small bakeries will continue to purchase noncontinuous baking ovens, mixers, proofers, and other baking equipment. Such equipment will be needed by cookie and cracker manufacturers, many of whom will continue to be involved in licensing agreements with foreign manufacturers, and will import equipment specified by the licensor. Pasta products will continue to show strong sales growth through 1980. Italian equipment for noodle extrusion will probably be used, and large amounts of packaging machinery will be bought mainly on the basis of its price.

**Fats and Oil Processing.**—There will be limited demand for equipment used in vegetable oil processing. The only equipment purchased in this industry through 1980 will likely be to supply expansion of existing companies. Vegetable oils will continue to be imported due to the lack of oil seeds available for production.

**Beverages.**—There will be a good demand for soft drink filling equipment until 1980. New beverage plants will be built and located in growing population centers. Beer production machinery will probably be in demand through 1980. There is expected to be little wine production machinery demand during this time as capacity in the wine industry exceeds the total demand many times over.

**Other Food Products.**—Equipment such as small filling, mixing, mincing, blending, and grinding machines will continue to be in strong demand during the 1976-80 period.

**Packaging Equipment.**—Packaging equipment while in great demand, will continue to be sold in types of fairly low capacity and technology.

## Buyers' Universe

In the mid-1970's there were 80 to 90 large food processing companies in Iran with 50 or more employees. In addition there were 130 medium-sized companies with 10 to 15 employees. Another 2,300 firms can be classified as bakeries and confectionery shops which buy limited amounts of food processing equipment. There were in addition a number of large integrated agribusiness enterprises engaged in both production and processing of crops and livestock (see Agro-industry chapter).

Most large food processing firms have not integrated vertically or horizontally into related production, and tend to be owned by a small group of investors who generally make all key buying decisions. Since imports of food processing machinery are prohibited by law to anyone other than actual producers, owners of large processing plants frequently buy directly from major European manufacturers, and often visit supplier's headquarters in Europe to negotiate details of sale personally. Medium-sized firms most often acquire equipment through Iranian representatives of foreign suppliers. Careful comparison shopping is common among managers of such firms, who usually finance their own purchases and buy on a letter of credit basis. Owners of small manufacturing companies as well as bakeries and confectionery shops tend to buy in the same manner as the owners of medium-sized companies.

## Foreign Suppliers' Universe

There was a minimum of 50 important foreign suppliers of food processing equipment to the Iranian market in 1976. In addition, there were over 30 firms which sold small amounts of processing equipment periodically. There were also some East European state firms such as Polymex Cekop of Poland, Techna Export of Romania and Techniprom-Export of the U.S.S.R. regularly selling food processing machinery in Iran.

**Meat Processing.**—Meat cutting equipment supplied by West German companies and Butcher Boy Inc. of the United States were selling well in Iran during 1976. Considerable quantities of packaging equipment are supplied by Grace S.p.A. and Garibaldi S.p.A. of Italy, and Modivac GmbH of West Germany. Hollymatic Corp., a U.S. manufacturer of machinery for forming hamburger patties, is the only large supplier of this product line in the country. Hollymatic Corp. supplies from a subsidiary company in Switzerland, Hollymatic AG. Intercool A/S of Denmark is a leading supplier of chicken rendering plants.

**Fish Processing.**—In 1976 Lubeca GmbH of West Germany signed a contract to build a canning fac-

tory in Bandar Abbas. Frigoscandia AB of Sweden is a leading supplier of cold storage equipment for fish production. Caviar processing equipment is completely supplied by Soviet trading firms.

**Milk and Milk Products.**—Alfa-Laval AB of Sweden and Intercool A/S of Denmark were leading suppliers of dairy plant equipment to Iran in the mid-1970's. A.P.V. Limited, a British supplier, was also building a pasteurized-milk plant in early 1977. Tetra Pak International AB of Sweden is a leading supplier of milk cartons for government milk plants.

**Fruit and Vegetable Canning.**—Tomato paste plants are supplied in Iran by two Italian firms, Rossi and Cattelli S.p.A. and T. Manzini & Figli S.A.S. Filling equipment for viscous products is sold by Tonazzi S.p.A. of Italy and weighing equipment comes from the Pneumatic Scale Corp. of the United States. Can seamers used by can producers are supplied mainly from Technomash of the Soviet Union.

**Other Food Processing/Packaging Equipment.**—In the mid-1970's beverage bottle lines were installed by George Meyer Company, a subsidiary of A-T-O Inc. of the United States, which is the leading supplier to Iran of soft drink bottling equipment. Blanchard and Collier Limited of Britain, A.B.R.S.A. of Belgium and R. B. Jorgensen of Denmark are leading suppliers of cutters, dicers, and mincers for the meat and vegetable processing industries. Skoda of Czechoslovakia and Polimex-Cekop Ltd. of Poland are the leading suppliers of sugar beet processing machinery and cold storage equipment, while grain milling equipment is almost all of Soviet origin. Labeling equipment is most often supplied by Purdy Machinery Co. Limited of Britain, Marsh Stencil Company of the United States, and Strunck GmbH of West Germany. United States suppliers provide most of the refrigeration equipment used in domestically assembled cold storage units. Carrier Corporation, which already is assembling air-conditioners in the country has effectively used its manufacturing presence to increase sales of refrigeration equipment.

There are a number of factors which contribute to the leading market position of European suppliers in Iran. Several European manufacturers have developed strong marketing programs in Iran. For example, Intercool of Denmark and Alfa-Laval of Sweden have set up branch sales and service offices. Other firms such as Lubeca of West Germany, whose technical sales personnel frequently visit Iran, have used the proximity of Europe to great advantage. Potential Iranian customers are often afforded the opportunity of observing installed equipment in operation through plant visits arranged by European suppliers.

## Marketing Factors

The Ministry of Commerce does not allow sales representatives of foreign suppliers to purchase major equipment items on their own account for demonstration or inventory. Representatives facilitate communications between the buyer and seller, but for all major purchases a buying trip to the supplier's factory is a standard feature. Installation of equipment is, in almost all cases, the responsibility of the supplier.

Firms selling "turnkey" processing plants normally provide a technical representative to remain until the plant has been operating for at least 2 to 3 months. In sales of smaller equipment, maintenance is normally performed by the purchaser's in-house staff, and very few maintenance contracts are provided for Iranian buyers. For this reason Iranian buyers do not tend to purchase technologically advanced equipment.

Major equipment is normally bought based on the reputation of the supplying firms rather than on a basis of price. Delivery times, however, tend to be critically important in purchase decisions. Price is an important factor in all sales, and buyers often get two or three bids from different Iranian representatives and then try to negotiate quotations downward.

Most sales are made on the basis of a letter of credit. Financing normally does not play an important role in equipment sales except for large plants offered to the Iranian Government by East European countries. Private firms buying imported equipment pay duties of between 10 to 25% for machinery. Government procurement offices are normally exempt from these duties. While importation of supermarket dairy cases is subject to prior approval by the Ministry of Industry and Mines there are no restrictions on importation of any other food processing equipment.

Local distributors in every major city of the country maintain stocks and sell small types of equipment such as slicers, mincers, ovens, and blenders to bakeries, confectionery stores, and other small businesses. Pricing and availability are the key factors in sales.

The normal promotion practices of food processing equipment suppliers to Iran are limited to personal calls and providing promotional material to potential buyers. There are no specialized trade journals or industry publications for advertising. However, some sales representatives buy space in the Persian-language newspapers on a sporadic basis.

## COMPETITIVE POSITION OF U.S. SUPPLIERS

Most U.S. firms regularly selling in Iran have appointed sales representatives. Some suppliers such



as Biro Company, Butcher Boy Inc., and Marsh Stencil Company have made exclusive representation agreements. Hollymatic Corp. which sells via its European agent has also appointed multiple sales agents in Iran. With the exception of FMC Corp., there is no U.S. firm which has established an Iranian branch office or a local technical representative. Through the late 1970's, U.S. firms will face increasing competition from foreign suppliers, particularly West German companies, whose representatives make frequent trips to Iran. Iranian buyers prefer

to be well acquainted personally with those from whom they buy.

U.S. firms will have to intensify marketing activities, emphasizing the establishment of a continuous presence in Iran, if they wish to increase sales appreciably. One possible marketing technique which has been successful in Iran is the formation of a consortium to provide a large range of capabilities and prices for Iranian buyers. If this were done, U.S. suppliers could increase their total sales several million dollars by 1980.

# Forest Resources Production

IRAN'S COMMERCIALLY exploitable forests are limited, and until the 1960's there was little investment in the forest products industry. Following nationalization of the forests in 1964, the Government has made a concerted effort to increase the forests' productivity, and annual capital expenditures in the industry have risen sharply reaching \$488 million in 1975. The Government is investing large amounts in projects for the production of lumber, paper and pulp, plywood and fiberboard. Private sector investment is going primarily for wood and paper products manufacturing.

Due to the rapid growth in demand for forest products and the large government investments, the industry will require large amounts of capital equipment during 1976-80. Expenditures for capital equipment grew from \$13 million in 1973 to \$57 million in 1975. All types of equipment will be required, with the greatest level of expenditures expected in 1977 and 1978. In 1975, U.S. suppliers provided almost one-third of all equipment purchased by the industry, with especially high sales of timber handling and hauling equipment. A large amount of equipment was also supplied by U. S. firms' subsidiaries in Canada and Europe.

## STRUCTURE AND SIZE

Eighteen million hectares or 11% of Iran's land is forest. Most of this hectareage is sparsely forested, mainly with scrub oak, wild pistachio, arax, and tamarisk, all unsuitable for commercial exploitation. Most of the commercial forest areas lie on the northern slopes of the Alborz mountains near the Caspian Sea. There are 3.4 million hectares of forests in this area, of which slightly over 1.3 million hectares, containing an estimated 256 million cubic meters ( $m^3$ ) of timber, are classified as commercial forests. The Government has long-range plans to raise the hectareage of exploitable forests through better forest management, strict controls over exploitation and afforestation projects.

Timber cut from the northern forests grew from 650,000  $m^3$  in 1970 to 900,000  $m^3$  in 1975. The amount of lumber produced rose from 403,000  $m^3$  in 1973 to 539,000  $m^3$  1975 (see table 1). Capital

expenditures in the wood and wood products industry grew from \$113 million in 1970 to \$488 million in 1975, an average annual growth rate of slightly under 35%. Experts have estimated that with proper exploitation methods and the construction of access roads, Iran's forests can product 3 million  $m^3$  annually of wood with no deterioration of their resources.

Before the nationalization of forest resources in 1964 there was virtually no government involvement and very little control over the industry. Small companies producing lumber, firewood, charcoal, and other products denuded large areas of forest lands. In 1968 a team of Bulgarian forest experts estimated 85% of the timber in the 3.4 million hectares of forests on the northern slopes of the Alborz was deteriorating.

Government participation in the forest resources industry is similar to that in the development of the nation's other natural resources. Through its nationalization program, the Government has declared all commercially exploitable forest land to be state property. Cutting of timber anywhere in the country can only be undertaken with the government's approval. By the end of 1976, there were 103 approved enterprises in the wood products industry. Many of these were small firms existing at the time of nationalization which were allowed to continue operations. Most new projects in logging and lumber production will be carried out by government-owned companies. The private sector is being encouraged to invest in intermediate and finished products, although some of the larger government projects include operations in these segments of the industry as well.

The revised Fifth Development Plan (1973/74-1977/78) calls for total capital expenditures of over \$1.3 billion in the areas of preservation and exploitation of forest and range land resources and in the cellulose and printing industries. Approved government projects in the wood industry will take an estimated \$895 million in capital expenditures, and the Plan calls for a further fixed investment of \$650 million from the private sector. Thus, if the Government's plans are implemented, the total capital expenditures will be over \$1.5 billion.



Table 1.—Iran: Development Indicators for the Forest Resources Industry

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
Persons employed in the Industry						
Wood & wood products .....	90,000	93,000	95,000	96,000	98,000	110,000
Pulp, paper, & paper products .....	9,000	10,000	11,000	12,000	13,000	17,000
Production of the Industry						
Production of lumber (thousands of m <sup>3</sup> ) .....	NA	403	450	539	1,600	1,200
Production of paper & paper board (tons) .....	59,000	60,000	66,000	70,000	75,000	350,000
Production of pulp (tons) .....	18,000	NA	32,000	45,000	60,000	260,000
Capital expenditures (millions of U.S.\$)						
Buildings, roads .....	105	153	289	431	495	664
Equipment & machinery .....	8	13	23	57	41	56
Total capital expenditure .....	113	166	312	488	536	720

<sup>1</sup> Estimated

Source: Iran Wood and Paper Industries, Ministry of Agriculture and Natural Resources, estimates based on trade interviews.

Iran's imports of wood and wood products rose from \$43.5 million in 1970 to \$253 million in 1975. Sawn lumber and paper are the major products imported and accounted for 90% of the total in 1975. It is not feasible for Iran to attempt to be self-sufficient in wood products, but the Government does plan to use its resources to their fullest capacity. Consumption of wood products rose sharply in the early 1970's. Paper consumption rose from 130,000 tons in 1970 to 398,000 tons in 1975, corresponding to a per capita increase in consumption from 5.0 kilograms to 9.8 kilograms. Consumption of sawn lumber, plywood, wood composition board, and veneers rose from 129,000 tons to 168,000 tons during the same period. Despite the country's inability to supply sufficient lumber products, the Government has not discouraged the use of wood in the construction and furniture industries and consumption is expected to continue to rise.

**Logging.**—With few exceptions, logging operations in the country are carried out by government companies. The large investments required for the construction of access roads, heavy harvesting machinery, and lumber production have been budgeted, and major government projects were being implemented in 1976.

**Gilan Wood and Paper Industries.**—A government company, Gilan Wood has been the largest company involved in harvesting activities since its formation in 1963. Responsibility for the operation of Gilan Wood was transferred from the Ministry of Agriculture to the government investment and holding company, Industrial Development and Renovation Organization (IDRO) in 1975. In 1976 Gilan Wood was producing from its Asalem Complex of factories, and was close to completion of a much larger complex, called the Punel Complex. Gilan Wood's Asalem Complex had license to exploit an area of 50,000 forested hectares in the northern province of Gilan. In 1975, it harvested 38,000 m<sup>3</sup> of timber, 5,000 m<sup>3</sup> without machinery.

**Neka Chub Complex.**—Neka Chub formed in 1969, is a government company under the Ministry of Agriculture. It had not begun operations by 1976, although most of its equipment had been shipped to Iran from Romania in the early 1970's. This equipment was for the most part of West German manufacture, reshipped from Romania. The company hoped to begin operation in 1977, at full capacity. Neka Chub will harvest 850,000 m<sup>3</sup> of timber per year.

A third large government company which was engaged in harvesting activities in 1976 was Farim Company also under the Ministry of Agriculture. Farim, which began operating in 1971, was designed by the United Nations Food and Agriculture Organization (FAO).

The largest private logging companies in 1976 were Emamzadeh Hashem Company, Golband Company, and Loveh Company.

**Lumber Production.**—The production of sawn lumber is also primarily a government activity. In 1975 Iran produced 539,000 m<sup>3</sup> of sawn lumber from its own forests. The Gilan Wood and Paper Industries was also the major producer of lumber. In 1975, Gilan Wood was producing at the annual rate of 15,000 m<sup>3</sup> of lumber and 18,000 m<sup>3</sup> of veneer.

**Fiberboard and Plywood Production.**—While the Government is involved in the production of fiberboard and plywood, private firms account for most of the production. In 1975, there were 12 companies with a capacity to produce 113,600 tons of fiberboard and plywood per year (see table 2). Only two of these companies were government-owned. Some private companies produced other products such as wood and Formica veneers, doors, windows, and furniture. The largest single producer is the government-owned Gilan Wood and Paper Industries with a production capacity of 36,000 tons of plywood and fiberboard per year.

**Table 2.—Iran: Fiberboard and Plywood Producers**

Company	Location	Products	Capacity
Behtarin Co. ....	Khorramshahr	plywood	9,000 tons
		fiberboard	3,000 tons
B. H. Company ....	Tehran	veneer	3.7 million m <sup>2</sup>
		plywood	2,400 tons
		particle board	6,000 tons
		pressboard and doors	15,000 units
Fibre Eslami ....	Babolsar	fiberboard	4,000 tons
Fibre Iran Co. ....	Bandar Pahlavi	fiberboard	22,500 tons
Gilan Wood Production and Industries ....	Gilan	N.A.	N.A.
Hels Iran Co. ....	Gazvin	veneer	3.7 million m <sup>2</sup>
		plywood	2,400 tons
Massachi Brothers ....	Tehran	N.A.	N.A.
Neopan Factory ....	Tabriz	particle board, pressboard	14,700 tons
Parquet B.W. and Michler Window Co. ....	Tehran	parquet	100,000 m <sup>2</sup>
Rasht Wood Industries ....	Rasht	N.A.	N.A.
Rukesh Chubi Iran Co. ....	Qazvin	veneer	3.7 million m <sup>2</sup>
		plywood	4,000 tons
Sakhtemanhaye Keshvari Co. ....	N.A.	N.A.	N.A.
Seh-la Fibre Co. ....	Tehran	veneer	1.8 million m <sup>2</sup>
		plywood	1,800 tons
Tavakoli Pressboard and Formica ....	Tabriz	particle board, pressboard	6,000 tons
Takhte Gorgan ....	Gorgan	fiberboard	24,000 tons
Takhteh Momtaz Co. ....	Tabriz	fiberboard	2,000 tons
		particle board, pressboard	2,000 tons

Source: Ministry of Agriculture, Ministry of Industry and Mines, IDRO, trade interviews.

The largest producer in the private sector in 1976 was Fibre Iran Company. Fibre Iran has two factories for the production of fiberboard, one near Bandar Pahlavi in the province of Gilan which produces 24,000 tons per year and the second, a subsidiary company called Fibre Eslami Company, whose factory in Babol, Mazandaran, has an annual output of 4,000 tons.

Two additional companies, Neopan Factory Company in Tabriz and Wood Industries Company in Rasht, produce at the rate of close to 14,000 tons per year; five other companies have an annual output ranging from 3,000 to 5,000 tons per year and two companies produce 1,000 tons or less.

**Furniture and Other Wood Products Producers.**—Iran's carpentry industry has traditionally been made up of small workshop producers, each typically employing two or three persons using manual production methods. In 1976 there were still thousands of such small carpentry shops throughout the country. Production methods have evolved somewhat, and the use of small electric-powered hand tools and table saws is increasing. Demand for the products of these workshops has increased sharply, and within the limitations of space and capital resources these units are expanding their operations. In Tehran, space is a limiting factor on growth of these firms since most are located in parts of the city where expansion in the size of the workshop is prohibited.

From 1970 to 1976, a number of larger industrial wood products firms were established (see table 3). Due to the sharp rise in demand for domestic and office furniture, wooden partitions, doors, and win-

dows, the development banks have promoted such projects.

Sentab Iran Company began producing furniture in the early 1960's and has been a pacesetter in the industry. Sentab's equipment is almost all West German. The company produced at the rate of 90,000 doors per year in 1975. It also produces a wide range of office furniture.

Foreign technical expertise has played a major role in the rapid expansion of the wood products industry. Some firms, such as Sentab Iran Company (foreign partner Svenska Entreprenad AB, Sweden) and Gazor Co. (foreign partner Alno GmbH, West Germany) are joint ventures between Iranian investors and foreign firms. Tehran Data Company is a new joint venture with Hoggenpohl GmbH (West Germany). Other firms produce under license of European companies. Decor Pars Company, for instance, produces a variety of products under license from four major French companies; Fildier et Cie.

**Table 3.—Iran: Wood Products Manufacturers**

Company	Location	Products
Akam Wood Industries Co. ....	Tehran	Office Furniture
Espeed Industrial Factories Co., Ltd. ....	Tehran	Office Furniture
Gazor Wood Work Inc. ....	Tehran	Residential and Office Furniture
Meuble Alborz ....	Tehran	Residential Furniture
Meuble Edalat Co. ....	Tehran	Residential and Office Furniture
Meuble Edward ....	Tehran	Residential Furniture
Meuble Saburi ....	Tehran	Residential Furniture
Sentab Iran Company ....	Qazvin	Office Furniture
Tehran Data Company ....	Tehran	Office Furniture



for windows, Houot S.A. for prefab houses, Perney S.A. for roofing construction, and AMCC S.A. for building carpentry.

**Basic Wood Chemical Production.**—In 1976 there were no industrial producers of wood chemicals, although Gilan Wood had nearly completed construction of a plant to distill alcohol and to produce nail polish remover, formalin, and acetic acid.

**Charcoal Production.**—Charcoal production rose from 253,000 tons in 1962 to 660,000 tons in 1970. During that period, charcoal was a major fuel for cooking and heating. Between 1970 and 1976 there was no growth in charcoal production, and output wavered between 600,000 and 660,000 tons. In mid-1976 there were a number of small firms licensed to produce charcoal and only one large producer, Gilan Wood. The method of charcoal production was still antiquated and there were no producers of charcoal briquets. The Government, through the network of rural cooperative stores, has actively promoted use of fuel oil in place of charcoal and the issue of new permits for the production of charcoal has been limited. Gilan Wood produces 19,000 m<sup>3</sup> of charcoal and 40,000 m<sup>3</sup> of firewood annually.

**Pulp and Paper Production.**—The production of paper is a very young segment of the industry. In 1976 there were only two pulp and papermaking mills in operation. The largest, the Pars Paper Company located at Haft-Tappeh in the southwestern province of Khuzistan, was established in 1970. In 1975 Pars Paper operated at 67% of its installed capacity and produced 45,000 tons of writing and wrapping paper. In 1976, the company was engaged in a project to expand its facilities from 70,000 tons annual capacity to 105,000 tons. Pulp at Pars Paper is produced from bagasse fiber supplied by the nearby Haft-Tappeh Cane Sugar Company. Pars Paper has one pulp mill supplied by Kraussmnefe, GmbH (West Germany) and two paper machines supplied by Walmsley's (Bury) Ltd. (U.K.). Another pulp and paper line was supplied by Sunds AB (Sweden).

Harir Pars Paper Mill, also located at Haft-Tappeh, went into production in 1975 and is the newest pulp and paper producer in the country. This company is a joint venture between Pars Paper Company and Harir, the latter being a producer of tissue and sanitary paper products. Harir Pars produced 3,600 tons of tissue in 1975 and has an annual capacity of 7,000 tons. Most of the original equipment for Harir Pars' plant was supplied by James Bertram & Son Ltd. (U.K.). In 1976 Reed International (U.K.) was awarded a technical service contract for operations of Harir Pars' plant and to advise the company on any new purchases.

Pars and Harir Pars were the only two companies producing paper from pulp in 1976. Other companies produce finished products from paper purchased either from these two companies or from abroad. Novzohour Paper Company imports tissue from Kimberly-Clark Corp. (U.S.). Several firms produce paper from recycled waste paper, and one firm, Kahrizak Company, established in 1927, produces paper from straw fiber.

**Paper Products Producers.**—There were 24 large producers of paper products in 1976 (see table 4). Of these, 14 produced corrugated cartons, 4 produced cardboard sheets and boxes, 4 produced tissues and sanitary paper products, and 2 produced other paper products. In addition to these 24 large producers, numerous manufacturing industries produced boxes, labels, and other paper products for their own use. A large number of small workshops, many in the Tahrán bazaar and the bazaars of provincial cities, produced notebooks, writing paper for stationery, paper bags, wrapping paper, and other similar items.

## GOVERNMENT ORGANIZATIONS

Two ministries have regulatory responsibility over forests and wood production projects: the Ministry of Agriculture and Rural Affairs, and the Ministry of Industry and Mines. The Forest and Rangeland Organization within the Ministry of Agriculture (see Agro-Industry chapter for organizational changes in the Ministry of Agriculture through early 1977) is responsible for the management of Iran's forests and for the afforestation program. The afforestation program has been expanded and in 1975 5,500 hectares were added, bringing the total hectareage planted since the beginning of the program to 29,500. In the 1960's The Forestry Guard was set up. Operated by the Ministry of Agriculture. The Guard is mostly staffed by military recruits who serve the organization for 20 months. The Neka Chub and Farim companies operate under the supervision of the Rangeland and Forest Organization.

The Ministry of Industry and Mines has primary responsibility for the development of the forest resources industry. The Ministry has operated through the government investment and holding combine, Industrial Development and Renovation Organization, which has directly invested in major projects in the industry. The Ministry has also encouraged private investment by funneling development credits through the development banks for private projects in the industry.

**Syndicate of Wood Industry Owners.**—The Syndicate of Wood Industry Owners located at 85 Shahreza Avenue, Tehran, is a licensed association

**Table 4.—Iran: Paper Products Producers**

Company	Location	Products	Capacity
Aber Ansari Carton Factory .....	Esfahan	cartons	15,000 tons/yr.
Alborz Carton Co. ....	Qazvin	cartons	4,000 tons/yr.
Carton Kar Co. ....	Qom	cartons	20 tons/day
Carton Sazi Miham .....	Tehran	cartons	24,000 tons/yr.
Container Corporation of Iran .....	Tehran	cartons	30,000 tons/yr.
Gol Rizan Co. ....	Tehran	paper napkins	9,000 pkg./day
		paper towels	1,500 pkg./day
		toilet paper	1,000 pkg./day
Harir Co. ....	Tehran	paper napkins	1 ton/day
		paper tissues	
		sanitary napkins	
H.R.H. Gholam Reza Pahlavi Carton Factory .....	NA	cartons	12,000 tons/yr.
Iran Carton Co. ....	Tehran	cartons	7,000 tons/yr.
Iran Moqava Co. ....	Tehran	cardboard	2,000 tons/yr.
Iran Tobacco Carton Co. ....	Tehran	cartons	3,500 tons/yr.
Kahrizak Paper Industries .....	Tehran	straw paper	15,000 tons/yr.
Kalk Co. ....	Tehran	paper	900 tons/yr.
Kashan Co. ....	Tehran	toilet paper	1 ton/day
		paper towels	
		paper napkins	
		sanitary napkins	
Khosrow Kazerooni Carton Factory .....	Shiraz	cartons	24,000 tons/yr.
Minoo Carton Co. ....	Abhar	cartons	12,000 tons/yr.
Moqava-Sazi Co. ....	Karaj	cardboard	7.5 tons/day
Moqava-Sazi Iran Co. ....	Tehran	cardboard	1,800 tons/year
Morad Panahpour Carton Factory .....	Ahvaz	cartons	NA
Novzohoor Paper Industries .....	Tehran	paper napkins	15,000 tons/yr.
		paper tissues	
		sanitary napkins	
Parsabak Co. ....	Qazvin	cartons	24,000 tons/yr.
Sharg Carton Co. ....	Tehran	cartons	1 ton/hr.
		cardboard	
Spavenel Industrial & Manufacturing Group .....	Saveh	cartons	5,000 tons
Tehran Carton Co. ....	Tehran	cartons	30 tons/day

Source: Ministry of Agriculture, Ministry of Industry and Mines, Industrial Development and Renovation Organization, trade interviews.

of 20 major companies involved in the production of wood and cellulose products. The syndicate is a source of information on developments in the industry and acts as a liaison between the Government and member companies.

## TRENDS, PROGRAMS, AND PROJECTS

Since the nationalization of the forests in 1964, which was one of the key objectives of the Shah of Iran's "White Revolution," the Government has embarked on two major categories of forestry programs. One program, implemented through the Forest and Rangeland Organization, is aimed at reversing the deterioration of Iran's forest resources. The program includes afforestation, reforestation, pollution control, and protection of forest areas from unlawful exploitation. A second program, implemented for the most part by the Industrial Development and Renovation Organization (IDRO), is aimed at improving the methodology and productivity of the forest resources industry. While these two government organizations have been relatively successful in carrying out their separate programs, difficulties arise, when they try to coordinate their programs because the organizations have different

functions. The Forest and Rangeland Organization's function primarily is protective, and IDRO's function primarily is productive.

In the 1960's the forest products industry was badly fragmented; companies in the industry used antiquated methods that did not require large capital investments. The Government began to infuse capital into the industry during the Fourth Development Plan (1967/68–1972/73) by devoting approximately \$420 million in development credits to the forest products industry. It significantly expanded its investment and scope of operations during the period of the Fifth Development Plan, and has earmarked \$1.5 billion for development of the industry. A number of other factors are also contributing to the growth of the forest resources industry. Demand for wood products has risen dramatically. Consumption of paper, for instance, has risen from 222,000 metric tons in 1970 to 330,500 metric tons in 1975. The demand for wood construction materials, chipboard, plywood, furniture, and other wood products has also shown strong growth during the 1970's. Demand for wooden doors, for instance, rose from an estimated 800,000 in 1970 to 1.8 million in 1975.

The period 1970 to 1975 witnessed the establishment of larger more diverse capital intensive producers in the industry (see table 5). In 1970, for



**Table 5.—Iran: Major Projects in the Wood Industry**

Name of Project	Location	Capital Investment (millions of U.S.\$)	Start Date	To Begin Production	Production
<b>Forestry</b>					
Neka Chub Co. ....	Neka		1969	1979	85,000 m <sup>2</sup> of furniture, 60,000 m <sup>3</sup> of lumber, 12,000 m <sup>3</sup> of plywood, 26,000 m <sup>3</sup> of particle board
Gilan Wood & Paper Industries Co...	Rezavanshahr	\$200	1963	1980	26,000 tons of corrugated cardboard, 23,000 m/tons of packaging paper, 10,000 tons of cardboard
Mazandaran Wood & Paper Industries Co.	Sari	\$290	1975	1979	48,000 tons of newsprint, 110,000 tons of writing paper, 9,500,000 m <sup>2</sup> wood, 55,000 tons of corrugated cardboard
Karun Cane Sugar Co. ....	Karun	\$355	1975	1980	200,000 tons of paper from Bagasse
Sentab Iran Company ....	Qazvin	N.A.	(Expansion)	1979	130,000 wooden doors and furniture
Windoors Company ....	Tehran	N.A.	1976	1978	375,000 wooden doors
Decor Central Co. ....	Tehran	N.A.	1976	1979	200,000 wooden doors
Chub Bana Company ....	Rasht	N.A.	1975	1977	180,000 m <sup>2</sup> of partitions
Samushak Company ....	Sari	N.A.	1975	1977	particle board
Gonbad Kavous Co. ....	Mazandaran	N.A.	1976	1978	particle board

Source: Industry interviews

instance, 6,000 tons of paper were produced. This paper was produced from pulp made from straw or recycled waste paper in small archaic plants. In 1975 there were two large paper producers, Pars Paper Company and Harir Pars Paper Company, which together produced 45,000 tons of paper.

Several goals for development of the industry are specified in the Fifth Plan.

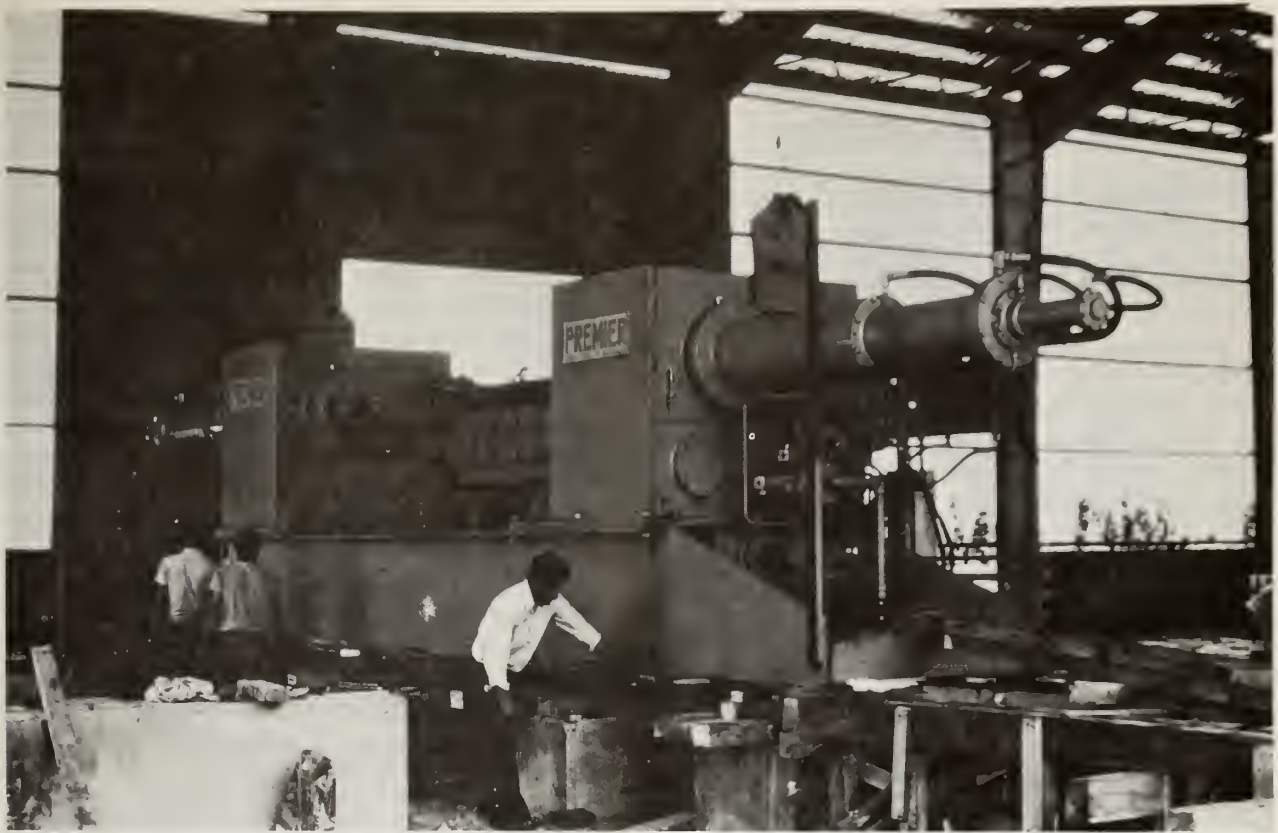
"A total of 600 kilometers of access roads and 1,000 kilometers of operational roads will be built in forest areas. Forest exploitation will increase to 840,000 hectares and the volume of timber produced will rise from 900,000 cubic meters to 3 million cubic meters at the end of the Fifth Plan.

"To maximize utilization of timber resources, wood industries will be established in heavy forest areas. Afforestation will take place on an area of 50,000 hectares. Rehabilitation of damaged forests on another 50,000 hectares will continue. If necessary, the services of foreign consultants and contracting firms will be utilized to introduce modern techniques in this sector."

To implement these goals, the Government has begun the planning and development of two large projects in the provinces of Mazandaran and Gilan. The Iran Wood and Paper Industries was set up in 1973 as a government-owned joint venture under the coordination of the then Ministry of Agriculture and Natural Resources, and the Industrial Development and Renovation Organization. According to its charter, Iran Wood and Paper is responsible for

(1) the renovation, creation, development, and management of the wood products industry, the pulp and paper industry, and the cellulose products industry; (2) development and exploitation of the forests; (3) the purchase and installation of industry-related factories; and (4) the purchase and import of the required raw materials. The sawmills and wood products plants that had been operated by the Ministry of Agriculture were taken over by Iran Wood and Paper in 1975. Similar facilities in Mazandaran remained under the Ministry of Agriculture at the end of 1976; it is likely that eventually they will also be turned over to Iran Wood and Paper.

Construction of the Punel Complex of the Gilan Wood and Paper Industries, located in Rezavanshahr, was underway in 1976 and scheduled for completion during 1977. The annual capacity of this integrated complex will include 52,000 meters<sup>3</sup> of lumber, 6,640 meters<sup>3</sup> of plywood, and the following types of paper products: 35,000 tons of wrapping paper, 40,000 tons of corrugated paper board, and 15,000 tons of cardboard. Total capital investment in the complex's plants will be \$200 million of which approximately half will be spent on equipment. The Punel paper mill will use 80% local hardwood pulp and 20% imported softwood pulp. The complex will require 630,000 m<sup>3</sup> of timber, which will be cut from 400,000 hectares of forests set aside for exploitation. The second project, the Mazandaran Wood and Paper Complex, is located 12 kilometers south of Sari, the provincial capital of Mazandaran province. Scheduled to be completed in 1979, the complex will then have the following annual capacity: 90,000 m<sup>3</sup> of lumber, 23,000 m<sup>3</sup> of plywood, 150,000 m<sup>3</sup> of particle



*A gang saw conveyor is being installed at Gilan Wood and Paper Industries plant.*

board, 70,000 tons of newsprint, 20,000 tons of writing paper, 86,000 tons of corrugated medium and 44,000 tons of chipboard, duplex and bristolboard. To provide the 1 million m<sup>3</sup> of timber the complex will require per year, a large portion of Mazandaran's forest land will be opened up for exploitation.

The primary contractor for both the Gilan and Mazandaran projects is Stadler Hurter Ltd., a Canadian subsidiary of International Systems and Controls Inc. (U.S.) Stadler Hurter originally won the contract to design the Gilan Wood and Paper project and set up an Iranian subsidiary, Stadler Hurter International Inc., to implement the contract. Stadler Hurter's responsibilities included the conduct of feasibility studies, design, procurement, and construction of the projects plus a 2-year management and training phase once the projects begin operations. Financing for these two projects is the result of a bilateral agreement between the Government of Iran and the Government of Canada. According to the original agreement, \$132.5 million was provided as follows: \$82.5 million by the Canadian Export Development Bank and \$50 million by the Bank of Montreal and The Royal Bank of Canada. Due to cost overruns additional credits of nearly \$50 million were extended in 1976.

In 1975, Stadler Hurter also won the contract for the design of the Mazandaran Wood and Paper projects, and set up a second Iranian subsidiary, Stadler Hurter Iran Company to implement the contract. The capital investment required to develop the Mazandaran project is \$290 million. At the end of 1976, there was no foreign financial assistance being provided for the Mazandaran project, although financing was reportedly being sought.

The Ministry of Agriculture and Natural Resources and IDRO have commissioned major studies on the forestry industry. In 1976, Jaako Poyry S.A. (France) was carrying out a study for a forestry management plan of the Caspian area on behalf of the Ministry of Agriculture and Natural Resources. In 1976, Bowater and Associates, a subsidiary of Bowater Paper Corp. Ltd. (U.K.) completed a master plan for IDRO on the pulp and paper industry in which it predicted that paper production from all available resources would rise to over 1,350,000 metric tons by 1988. The capital investment required to achieve this would be approximately \$1.3 billion.

The Government also plans to promote private investment in the development of wood products manufacturing. A number of such projects, particularly for the production of furniture, partitions, doors



and windows had been approved during 1975 and 1976.

## GROWTH PROSPECTS

Government projects will account for most of the future growth of the forest industries in Iran, particularly in the areas of timber harvesting, lumber production, and pulp and paper production. During the period of the Fifth Development Plan, allocations for government investment in the industry are approximately three times as high as during the period of the Fourth Development Plan. The Government focused attention on the lumber and wood products industry during the Fourth Plan when the Neka Chub, Farim Company and Iran Wood Industry of Rasht projects were developed. The Farim Company and Iran Wood Industry began production during the plan period. Neka Chub had not yet begun production in 1976, and most of its equipment, although imported in the early 1970's, had not yet been installed.

The major projects of the Fifth Plan were behind schedule in 1976. Although the Punel Complex was expected to begin production in the summer of 1977, it will not be operating at full capacity until 1979. Informed officials estimated that the Mazandaran project, scheduled to begin production in 1979, would probably be delayed 1 or 2 years. Despite delays in these major projects, the industry as a whole is expected to continue to grow, and purchases of capital goods will follow close to plan. The major obstacles in meeting plan schedules were shortages of building materials and port congestion which caused delivery delays.

## CAPITAL GOODS MARKET

Sales of capital equipment to the lumber and wood products industry grew rapidly during 1973-75, rising from \$13 million in 1973 to \$57.4 million in 1975 (see table 6). Less than 1% of the market was supplied by domestic manufacturers in 1975, but their share is expected to increase to about 10% by 1980 as production of heavy logging equipment and small-scale woodworking machinery increases. Growth of the market will be irregular during 1976-80, reflecting the phasing of purchases for major government projects. The market is expected to reach \$56 million in 1980.

Timber harvesting and handling equipment purchases in 1975 amounted to \$30.7 million, up from only \$2.8 million in 1974. This does not include roadbuilding machinery used to build access roads in the forest areas. A large amount of such equipment

**Table 6.—Iran: Size Of the Market For Forest Resources Industry Equipment**  
(thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>TIMBER HARVESTING AND HANDLING EQUIPMENT</b>					
Domestic Production .....	47	140	280	600	3,000
Imports					
United States .....	20	1,772	16,435	4,300	5,400
Canada .....	0	10	9,214	—	—
West Germany .....	283	529	2,126	—	—
Italy .....	133	129	607	—	—
Others .....	40	255	2,043	—	—
Total .....	476	2,695	30,425	8,400	10,500
Market Size .....	523	2,835	30,705	9,000	13,500
<b>WOOD PROCESSING EQUIPMENT</b>					
Domestic Production .....	211	283	419	500	3,000
Imports					
United States .....	20	9	624	800	1,250
Canada .....	0	32	3,056	—	—
West Germany .....	848	1,586	6,379	—	—
Italy .....	399	388	1,822	—	—
Others .....	139	351	2,298	—	—
Total .....	1,406	2,366	14,179	16,000	22,000
Market Size .....	1,617	2,649	14,598	16,500	25,000
<b>PULP AND PAPER MILL MACHINES AND EQUIPMENT</b>					
Domestic Production .....	—	—	—	—	—
Imports					
United States .....	222	3,329	1,264	1,500	1,500
Canada .....	0	5	4,105	—	—
West Germany .....	2,493	1,396	270	—	—
United Kingdom .....	4,738	5,568	814	—	—
Others .....	201	837	1,195	—	—
Total .....	7,654	11,135	7,648	10,500	11,000
Market Size .....	7,654	11,135	7,648	10,500	11,000
<b>EQUIPMENT FOR PULP AND PAPER PRODUCTS MANUFACTURING</b>					
Domestic Production .....	—	—	—	—	—
Imports					
United States .....	203	954	140	700	900
West Germany .....	1,397	2,769	1,971	—	—
United Kingdom .....	51	971	209	—	—
Switzerland .....	855	889	1,283	—	—
Others .....	890	913	883	—	—
Total .....	3,396	6,496	4,486	4,800	6,500
Market Size .....	3,396	6,496	4,486	4,800	6,500
<b>MARKET TOTALS</b>					
Domestic Production .....	258	423	699	1,100	6,000
Imports					
United States .....	465	6,064	18,463	7,300	9,050
Canada .....	0	47	16,375	—	—
West Germany .....	5,021	6,280	10,746	—	—
United Kingdom .....	4,798	6,554	1,163	—	—
Others .....	2,648	3,747	9,991	—	—
Total .....	12,932	22,692	56,738	39,700	50,000
Market Size .....	13,190	23,115	57,437	40,800	56,000

<sup>1</sup> Estimated.

Source: United Nations, Organization for Economic Cooperation and Development, supplier country and official Iranian trade statistics; estimates based on trade interviews.

was in use by construction companies contracted to Iran Wood and Paper Industries in the forest areas of Gilan and Mazandaran in 1975 and 1976. Sales of timber harvesting and handling equipment are

expected to rise to \$40 million in 1978 and fall to \$13.5 million in 1980. The two major government projects in Mazandaran and Gilan comprise logging operations on an unprecedented scale for Iran. All of the basic equipment for Gilan has been purchased and therefore the largest portion of additional sales will be of new equipment for the Mazandaran project.

It is anticipated that the growth rate of wood processing equipment sales during 1976-80 will slow to 12% per year after more rapid growth in 1973-75, when it rose from \$1.6 million to \$14.6 million. Within this category, the strongest growth is expected to be in sales of equipment for the manufacture of furniture and other final wood products such as doors, windows, and partitions.

Sales of pulp and paper mill machinery and equipment for paper products production fell in 1975 to \$7.6 million and \$4.5 million respectively. There are three major paper production projects scheduled to be implemented during 1976-80. Sales of equipment for paper and paper products production are therefore expected to rise during this period, but growth will be uneven. It is estimated that the market for pulp and paper mill machines will amount to \$11 million in 1980, while sales of machinery and equipment for manufacturing pulp and paper products will rise to \$6.5 million.

## Imports

West German suppliers have traditionally held the dominant position in the market, accounting for approximately one-third of all sales through 1974. The share of U.S. suppliers grew significantly in 1974 and 1975. U.S. firms accounted for about 30% of sales during those years and their sales are expected to remain high as they supply the large government projects in the north. In 1975 U.S. firms supplied timber harvesting and handling equipment valued at \$16.4 million, and also supplied approximately 17% of the pulp and paper mill machinery. In 1974 the Canadian Government and major Canadian firms became primary advisors to the Iranian Government on industry development projects. Imports from Canada, almost all of which have gone to equip government projects, rose to \$16.4 million in 1975. Canadian suppliers are expected to continue to hold a major share of the market through 1980.

West German and Italian suppliers lead in sales of wood processing equipment. They are particularly strong in sales of basic woodworking equipment to furniture and building materials manufacturers. Canadian suppliers, who held 20% of this market, in 1975, supplied sawmill, plywood, and chipboard equipment to the Gilan Wood and Paper Industries.

Suppliers from the United Kingdom and the United States sold large orders of paper and pulp producing equipment in 1974 to equip the two paper mills in Khuzistan. Canadian suppliers held the dominant position in the market in 1975, with most of their equipment going to the new Gilan Paper plant. U.K. and U.S. suppliers will more than likely increase their sales again in 1978 when the Karun bagasse paper plant will be ready for equipment.

## Domestic Manufacturing

Three Iranian firms manufacture wood processing equipment: Sakkaki Company, Mehrina Company, and Ferniaco Company. Two small workshops, Niru and Aria, produce some woodworking equipment on an irregular basis. Total sales of these producers in 1975 were estimated at not more than \$420,000. Sakkaki's product line in 1975 was: a four-purpose machine (plane, circular saw, band saw, and notcher) three sizes of circular saw (60, 80, and 100 centimeters—cm), a 60 cm × 200 cm plane, and a band saw. Production depended on the level of orders but averaged one piece of equipment every 3 days. The product lines and level of production of the other two firms are similar. Ferniaco made a five-purpose machine under license of Loren et Cie. (France).

The main purchasers of domestically produced equipment were the smaller producers; larger manufacturers prefer imported equipment. The Industrial Development and Renovation Organization (IDRO) in 1976 was considering adding machine tools for the wood industry to the product line of one of its machine tool manufacturing companies. Wadkin Limited (U.K.) plans to produce wood lathes, saws, and other basic wood processing equipment when the IDRO plan materializes. It is estimated that domestic suppliers will account for 12%, or \$3 million, of woodworking capital equipment sales by 1980, and total imports will amount to \$22 million that year.

In 1975 domestic suppliers sold \$280,000 worth of wood harvesting and handling equipment. Trucks made up the majority of this equipment, with Khavar Company, the Iranian producer of Benz trucks, and Nissan Iran Company, a producer of smaller pickup trucks, being the major suppliers. Domestic suppliers are expected to increase their share of the market from 1976 to 1980. HEPCO, a producer of large materials handling equipment, and the domestic producers of trucks are expected to supply the largest portion of replacement equipment to the industry. Iran does not export any forest resources industry equipment and is not expected to do so by 1980.



## MARKET OPPORTUNITIES

To fulfill Iran's plans for the forest resources industry during 1976-80, large amounts of all categories of capital equipment will be required. Since the technology of large-scale logging operations and industrial wood and paper products manufacturing is new in Iran, there will also be opportunities for sale of technological know-how to the industry, either through joint venture arrangements or licensing agreements.

**Harvesting and Log Handling Equipment.**—Sales of all types of equipment for the building of access roads to the northern forest areas, cutting equipment, skidding tractors, and hauling equipment is expected to grow rapidly, particularly during 1976-78. Because traditional forest harvesting operations are small, and until the mid-1970's were mainly done manually, with hauling by light inexpensive equipment, most of Iran's current stands of forest must be made accessible to heavy harvesting and hauling equipment.

Harvesting activities of the new Punel Complex of Gilan Wood and Paper Industries will reach their full operational level of 630,000 m<sup>3</sup> of timber in 1977. Road construction in an area of 400,000 hectares of forests will be necessary after that period. Construction of access roads in the forests to be harvested by the Mazandaran Complex was underway in 1976. Actual harvesting activities are expected to begin in 1979. Both of these major projects will require large amounts of equipment.

**Wood Processing Equipment.**—Sales opportunities for a variety of wood processing equipment will increase during 1976-80. Both Gilan Wood and Paper and Mazandaran Wood and Paper will purchase large amounts of equipment for their wood products plants. Specific types of equipment that will be required are sawmill machinery including lumber handling equipment, plywood production equipment, and chipboard production machinery. Private investment in fiberboard and chipboard plants and wood furniture and construction materials manufacturing plants will assure a growing market for equipment used in these industries. The main market will be for basic woodworking equipment such as saws, planers, sanders, notchers, and joiners. Supply from domestic manufacturers of woodworking equipment will grow, but most large producers will continue to use imported equipment.

Within the wood products industry, there will continue to be a strong need for technical services. Many Iranian firms which have begun production have acquired technical assistance from equipment supplier companies through contracts with specialized

consultants, joint venture arrangements or licensing agreements with foreign companies. The development banks which provide loans and equity for new projects have usually required that foreign technical expertise be obtained.

**Paper and Pulp Mill Machines and Equipment.**—Three pulp/paper mill projects are scheduled to be implemented during 1976-80. The paper mill of the Punel Complex of Gilan Wood and Paper was being equipped in 1976, with most of the equipment having been shipped by Canadian suppliers. Construction on the Mazandaran complex paper mill will begin in 1977 and most of the equipment will be shipped in 1977 and 1978. Operation of the mill is scheduled to begin in 1979. In 1976 Stadler Hurter (Canada) was doing the basic design for the entire Mazandaran project as it had for the Punel Complex and it is expected that most of the equipment will be chosen from Canadian suppliers.

A third paper mill is scheduled to be built in the southern province of Khuzistan and will use bagasse from the cane fields of the Karun Agro-Industrial Project. Equipment for all three projects will be chosen by the consulting engineering firms, Stadler Hurter for the two projects in the north, and Reed International (U.K.) in the south.

## MARKETING ENVIRONMENT

### Buyers' Universe

Major buyers of capital equipment in the Iranian forest products industry are those organizations which purchase for the large government companies and projects. For the large new projects in the northern provinces, the main purchasing organization is Stadler Hurter. Almost all purchases of new equipment are made by international tender issued by Stadler Hurter's headquarters at 1600 Dorchester Boulevard West, Montreal, Canada. Stadler Hurter's purchases of construction materials are made by tender in Tehran. The Industrial Renovation and Development Organization reviews and approves all major purchases for these projects. It is estimated that Stadler Hurter purchases for the Iran Wood and Paper Industries during 1976-80 will be equivalent to one-third of all capital equipment purchases by the industry. A second major government purchaser of equipment is the Forestry and Natural Resources Organization located at Elizabeth Boulevard and 21 Azar Street in Tehran.

There are about 30 other medium-sized purchasers of equipment in Iran and several thousand smaller purchasers of woodworking equipment. Replacement equipment for these medium-sized firms



and all equipment for the smaller firms are purchased from local agents of foreign suppliers, or from the domestic suppliers. Until 1976, the owners of large new projects in the private sector almost always traveled abroad to select all their equipment. The entire equipment requirements of such plants are usually purchased on a turnkey basis, and purchase contracts normally include services for set-up and initial operations of the plant.

### Foreign Suppliers' Universe

The trend toward modernization and expansion of the wood and paper industries is fairly recent, and by mid-1976 there were still only a limited number of foreign suppliers of equipment represented by agents in Iran. West German, Swiss, and Italian suppliers are exceptions and have been represented for a relatively long period of time. There are several reasons why relatively few foreign suppliers have appointed sales representatives in Iran. Purchase decisions for a large portion of the machinery and equipment supplied to the industry are made by the consulting firms working on the major government projects. These consulting firms have supplier contracts in all major producing countries, and equipment orders are normally placed directly with those suppliers. In the private sector, equipment for new chipboard and plywood projects is usually purchased on a turnkey basis. The purchaser almost always travels abroad and makes his purchases directly from supplier companies, or through foreign consulting firms specializing in the industry.

Suppliers of heavy equipment for logging, hauling operations, and roadbuilding also sell large amounts of other heavy equipment to Iran's construction industry, and are actively represented in the country for that reason. Caterpillar Tractor Co., International Harvester Co., and Allis-Chalmers Corp. (all U.S.) are the main suppliers of timber and lumber loaders in Iran. All three have their own Iranian subsidiary sales and services companies, although specialized equipment is usually ordered either from their U.S. or overseas manufacturing plants. Cutting equipment for government projects in the north of Iran has mainly been supplied by Unamec International Limited (U.K.). The major supplier of chain saws is McCulloch Corporation, a subsidiary of Black & Decker Manufacturing Co. (U.S.). Lifting and handling equipment in these projects has been supplied by Toyota Company (Japan) and Lansing Limited (U.K.). Trucks for hauling have mainly been supplied by Canadian Kenworth Limited, a Canadian subsidiary of PACCAR Inc. (U.S.).

In 1976 a variety of sawmill equipment was being used in Iran. This equipment had been purchased

directly from manufacturers not yet represented in Iran. In the Gilan sawmills, equipment was supplied by Simonds Saw & Steel Company (U.S.) and Stutgardt GmbH (West Germany). Most of the smaller saws in use were supplied by domestic manufacturers. Canali Gebr. (West Germany) had installed several sawmills, one in Neka Chub, and the other in Iran Wood Industries. The sawmills for a railroad tie factory were supplied by Wehrmann GmbH (West Germany), and the sawmill of the Farim Company was supplied by Danckaert S.A. (Belgium).

Planing mill equipment being used in the government projects was supplied by Michael Weinig KG. (West Germany) and S.I.C.A.R. (Italy).

In 1976, there were several suppliers of equipment for plywood, chipboard and fiberboard production represented in Iran. C. Siempelkamp & Company (West Germany) was the leading supplier. Siempelkamp had equipped several plants over a period of years, was the supplier for the Mazandaran Wood chipboard plant in Sari, and had also been chosen to equip the chipboard plant at Gombade Kavous. Robert Hildebrand GmbH (West Germany) was also locally represented and has equipped several fiberboard factories. Becker & Van Huellen (Germany) is represented in Iran and in 1976 was installing press equipment in the recently formed Samushak Company's chipboard plant. Bison GmbH (West Germany) has a good position in Iran; it equipped one plant and was awarded contracts for two additional plants, one in Mashhad and one in Khuzistan province. The most successful Swedish supplier of chipboard producing machinery is Defibrator Maskin AB. Plywood production equipment in use in 1976 was supplied by A Cremona e Figlio (Italy) and La Vallette (France).

Several foreign suppliers of woodworking and carpentry equipment are represented by Iranian trading firms and Wadkin Limited (U.K.) has its own branch office in Tehran. In 1976 the most successful suppliers of a great variety of woodworking equipment were from Italy and West Germany. The leading suppliers for basic woodworking machines are Centauro and S.I.C.A.R. (both Italy) and M. Bauerle GmbH, Koelle GmbH, and Fromm GmbH (all West Germany). S.C.M. (Italy) made large sales of saws and rotors. Holz-Her Reick (West Germany) was selling specialized edge benders, panel sizing and dowelling machines. Michael Weinig (West Germany) had good sales of "four-side molding machines" while Robert Buerkle & Co. and Ott & Co. KG. (both West Germany) were well known in the market for supply of veneering presses.

In 1976, there were four major suppliers of electric powered handheld drills, saws, and sanders. Black & Decker (U.S.), which supplied from its



U.K. manufacturing subsidiary, Black & Decker Ltd., was the leading supplier, and accounted for over 40% of sales of this type of equipment to the woodworking industry. Bosch GmbH and AEG (both West Germany) together accounted for approximately 40% of the sales in 1976. The fourth major supplier, which held approximately 15% of the market in 1976 was Metabo (Japan).

Pulp and paper producing equipment is ordered directly from supplier companies. Sales of all pulp and paper equipment are made through the firms consulting on 5 plant projects. The Pars Paper Company uses pulp machinery from Krauss-Manfei AG (West Germany) and pulp and paper machinery from Walmsley's (Bury) Limited (U.K.). Equipment purchased for the Gilan Wood project includes a 625 ton per day Fourdrinier from Black-Clawson-Kennedy Limited (Canada), subsidiary of The Black Clawson Co. (U.S.).

A large portion of the capital equipment for the forest resources industry in Iran has been supplied under the umbrella of government-to-government agreements. During the 1960's Iran concluded such agreements with Eastern European countries, and equipment for the Neka Chub complex and the Asalem Complex was supplied by manufacturers from these countries. Canada's success in the mid-1970's has also been largely the result of a government-to-government agreement. The Canadian Government offered \$132.5 million in credit to Iran through its Export Development Bank, the Bank of Montreal, and the Royal Bank of Canada.

One of the most successful marketing efforts for selling to private firms has been developed by Fomberm Company (Iran). Fomberm represents suppliers of a wide range of equipment for wood processing and woodworking. It has completely supplied several plants and operates its own wood products company, Decor Pars, which produces under license of several French firms. Fomberm has its own full-time engineering and sales staff in Iran and brings in supplier company specialists on a short-term basis to help in its sales and consulting efforts. It has also provided maintenance for all equipment sold.

Black & Decker set up a sales and service subsidiary in Iran in 1973, and in 1976 had a central dealership in Tehran and two provincial sales and service dealerships in Ahvaz and Esfahan. Black & Decker sales grew rapidly from 1973 to 1976. Black & Decker plans to expand its sales network by establishing five more provincial centers. The firm's dealerships service equipment other than that of its own manufacture and will accept "trade ins" of other equipment on sale of its own. The industrial market for power tools is very competitive but through an aggressive sales effort Black & Decker has managed to outsell its main competitors, Bosch

and AEG, and now has most of the market for power woodworking hand tools, a market previously nearly neglected.

## Marketing Factors

In 1976 most capital equipment for the forest resources industry was purchased outside Iran and supplied directly from supplier's plants. There were still few manufacturers' representatives established in Iran, although by the mid-1970's the growth of the industry, due to large government projects as well as increased activity in the private sector had resulted in establishment of sales representation for more supplier companies.

Technical and after sales service capabilities of suppliers are becoming increasingly important factors in purchase decisions. Iranian buyers have in the past relied on European-based consulting firms and equipment suppliers for technical advice. However, because of the higher volume of equipment sales in the mid-1970's it became feasible for several Iranian agents of the more successful suppliers to develop their own maintenance and consulting capability.

Strong Iranian representation, aggressive sales efforts and after sales service capabilities have been important factors in the success of certain suppliers, particularly in making sales of basic equipment used by the large number of wood products manufacturers, such as plywood, fiberboard, furniture, and wood construction materials producers.

None of the Iranian importers or representatives maintain inventories of large, expensive capital equipment. Such equipment is imported only on the basis of firm orders. One or two firms maintain inventories of carpentry and woodworking machine tools and spare parts. Delivery time for woodworking equipment and availability of spare parts is most important, particularly since imports must compete with the equipment of domestic manufacturers who can usually guarantee rapid delivery.

Tractors and other heavy machinery for use in wood harvesting, paper mills, and paper products manufacturing are exempt from import duties, but are assessed at 5% ad valorem commercial benefit tax (CBT). Machine tools, hand and power tools used for woodworking are subject to 10% customs duties plus 5% ad valorem CBT, and require prior approval of the Ministry of Commerce and the Ministry of Industry and Mines to be imported.

Most new private projects have received loans from the government development banks. Information on the formation of such projects can be obtained through the development banks. Information on wood products manufacturers can also be obtained from the Wood Industries Owner's Syndicate. Equipment for government projects is normally pur-

chased by public tender. There are no specialized Iranian trade journals for the forest resources industry, nor are there any regularly scheduled trade exhibitions for the industry in Iran.

### **COMPETITIVE POSITION OF U.S. SUPPLIERS**

With few exceptions, U.S. suppliers of wood industries equipment are not well known in Iran. U.S. companies which have made significant sales are Caterpillar Tractor Co. and International Harvester Co. for wood harvesting equipment, and Simonds Cutting Tools Wallace-Murray Corporation for sawmill equipment.

Sales by U.S. firms grew in 1974 and 1975, largely as a result of the role of Stadler Hurter in the development of the forest products industry. U.S. suppliers of wood harvesting, sawmill and pulp and papermaking machinery can expect to maintain a good level of sales through 1980. The major portion of equipment for large projects will be pur-

chased by international tenders issued from Stadler Hurter's Montreal office.

A large number of U.S. firms supply the Iranian market from offshore subsidiary manufacturing plants. Caterpillar Tractor Co. ships from Europe and the Far East and only supplies a small portion of shipments to Iran from the United States. Black Clawson Co. manufactures and ships from its subsidiary, Black-Clawson-Kennedy Ltd. in Canada. PACCAR Inc. manufactures and supplies Kenworth trucks from its subsidiary company, Canadian Kenworth Ltd. Black & Decker Manufacturing Company supplies the Iranian market from its subsidiary Black & Decker Ltd. (U.K.).

U.S. suppliers of wood processing and wood-working equipment for particle board, plywood, and furniture manufacture may encounter stiff competition from European suppliers who are well established and represented in Iran. The formation of a consortium of U.S. manufacturers of a wide range of equipment which offers design, technical consulting and after sales service would be an effective approach to meeting competition from established suppliers.



# Government, Business, and Financial Establishments

DEMAND FOR business equipment and systems by the Iranian government, business, and financial establishments grew rapidly during the period of 1970-75 as a result of the substantial growth in the economy as a whole. Imports of business equipment in 1975 were valued at nearly three times the 1970 level, rising from \$37 million to over \$96 million. Total computer placements increased rapidly as well, from 63 in 1970 to 268 by 1975.

Iran's Gross National Product (GNP) almost doubled during the 1973-76 period. Iran's rapid development has made the use of more sophisticated management systems both practical and necessary. Expansion of internal and international trade plus a growing government role in managing this volatile economy has created an acute need for more sophisticated business equipment and software which even as late as the early 1970's were not being sold in Iran.

U.S. suppliers in 1975 accounted for one-third of all imports of business equipment. Increasing competition from the Far East has resulted in a reduction of the market shares held by other major suppliers such as those from the United Kingdom and West Germany. Because of the recognized high technological level of American products, U.S. suppliers have maintained a strong market share since 1970.

Sales of computers, peripherals, and software, advanced accounting machinery, microfilming equipment, and electric typewriters by U.S. suppliers should continue to be strong until at least the mid-1980's. There are excellent opportunities for new firms to enter the market, as well as for firms already active in Iran to increase their market share through more active promotional programs. The sales of business equipment and systems is expected to reach \$182 million in 1980.

## STRUCTURE AND SIZE

### Government Offices

In 1976, Iran's public sector included 18 ministries and over 200 separate government agencies em-

ploying 887,000 people, 350,000 of whom were classified as permanent government civil servants. In 1970, government capital expenditures totaled \$2.6 billion. Largely as a result of the increase in government credits for development projects, capital expenditures had risen to \$7.7 billion by 1975. Government purchases of business equipment and computers amounted to \$31.9 million in that year, about 35% of total sales by value for business systems in the country. Over 44% of installed computers (by value) in 1975 were owned by government agencies. Nearly all computer systems used by government agencies were programed to do payroll and record keeping. In addition, a small number of government organizations employed computerized systems for management and data processing analytical purposes.

**Large Government Organizations.**—The Ministry of Education, with approximately 175,000 employees in 1975, is the largest ministry. In the mid-1970's it operated 22,000 schools throughout the country and had regional offices in major population centers. It is estimated that in 1975, the \$5.7 million worth of business equipment bought by the Ministry of Education accounted for 18% of government business equipment expenditures. Most of the equipment was used to supply the country's schools. A typical school has several Persian script typewriters, possibly a Latin script typewriter, one or two adding machines, filing cabinets, and other furniture. The Central Office of the Ministry of Education has two rented computers; one an International Business Machines Corp. (U.S.) IBM/370/125 installed in 1975 used for payroll and record keeping, and the other a Control Data Corp. (U.S.) CDC Cyber 72 which was being installed at the end of 1976.

Eight of the 13 state universities in Iran have purchased computer systems. Jondi Shahpour University was the first. It purchased an IBM System 3 in 1971. In 1976 the university had decided to replace its IBM system with a Data General Corp. (U.S.) Eclipse C-300 unit to be installed in early 1977. The other seven universities having computers purchased them during the 1973-74 period. Most

systems are IBM and are used for accounting, payroll, and staff requirements as well as for training and research purposes.

The Ministry of Health and the Red Lion and Sun Society, a government agency, operated over 75% of all hospitals in the country. Together, these two agencies employ 85,000 people, most of whom work in Tehran. Business equipment purchases for central and provincial offices and 380 hospitals totalled \$2.5 million in 1975, 8% of total government expenditures in this field.

Other major purchasers of business equipment in the 1970's were the Plan and Budget Organization (PBO), the Ministry of War, (responsible for the operations of all three branches of the Iranian military), the Ministry of Post, Telephone and Telegraph, and the Ministry of Energy (MOE). The MOE and its subsidiary power generation and distribution companies use computerized billing services for electrical power customers. They also make use of computers to project and plan for future power requirements. The Ministry of Agriculture employs a UNIVAC system (Sperry Rand Corp., U.S.) for agricultural forecasting and harvest projections. The Telecommunications Company of Iran uses some specialized function computers for telex channel relay and message centers.

The PBO is the planning body of the Government of Iran. In this institution Iran's 5-year plans are drawn up and the execution of the plans is monitored.

The Informatics division of the PBO employed about 650 persons in 1976. The division's computer center had about 100 persons including 20 systems engineers, 30 programmers (trainee) and 50 key-punch operators. Among the 25 administrative personnel at the center were eight expatriate specialists.

In 1976, the PBO began to phase out its IBM 370/145 equipment and introduce the model 158 as a multiprocessor in connection with its IBM 370/158 unit. The core capacity will be 2 mega bytes, with the total configuration capacity at 4 mega bytes. There are five smaller (some mini) computers at the other offices of the PBO. There are two IBM System 3 computers at the School of Statistics and Informatics with a core capacity of over 48K, one NCR Century 100 at the PBO's Koushk Building Offices which has a 64K core capacity, and two Burroughs L5000 minicomputers at the Accounts Division. These computers are linked by five remote job entry devices.

The computer room operates on two shifts. All the configurations are programmed by Cobol. The basic processing done is for project control; the computers are also used for various management applications, and for budget allocations.

The PBO is building a data base system, which during the early 1980's will link all the government ministries by an online system.

## **Industrial and Commercial Enterprises**

In the 45 years from the approval of Iran's first commercial code in 1931 to March 20, 1976, close to 22,000 commercial companies were officially formed and registered (see table 1). The rate of registration of new companies rose in the mid-1970's. In 1975 about 4,000 companies, capitalized at \$1.2 billion, were registered. However, only a small percentage of business enterprises, representing the country's largest firms, are registered. In 1976 there were an estimated 580,000 industrial and commercial establishments. Slightly over 95% of all establishments were small workshops and retailers which employed an estimated total of 1 million people.

**Industry.**—There are only 490 large industrial plants in Iran with 100 or more employees. It is estimated that purchases of business equipment by this group of large plants represents between 6% to 8% of all yearly business equipment demand. Smaller plants number over 260,000.

The manufacturing sector's 62 units accounted for about 20% of all computer placements by value in 1975. Most computers are used primarily for payroll and accounting, although there is growing interest in inventory control and distribution analysis applications. The Arj Company, a major manufacturer of industrial equipment and domestic appliances, has an IBM inventory and control system.

The transportation industry employed 280,000 people in 1975. This industry includes the Iranian State Railways with 32,000 employees and large shipping companies such as The Arya National Shipping Line and Irano-Hind Shipping Company. Iran Air, the national airline, installed an IBM computer reservation system in 1975 and has plans to computerize maintenance and spare parts inventory as well as route programming. Of 16 representative offices for foreign airlines in Iran, only Swissair had a computerized terminal (Raytheon, U.S.) used for international booking in 1976. The system includes CRT displays terminals, magnetic tape cassette drives, and ticket printers, and operates online to the airline's Zurich processing center. The system is used for reservations and hotel bookings. There is little equipment used by the nation's eight large trucking companies outside of general office equipment. The transportation industry accounted for 8% of Iran's total business equipment purchases in 1975.

**State-Owned Industry.**—Of the 490 major manufacturing plants in Iran in 1976, over 115 belonged to the Government which owned and operated most primary metal processing, steel making, coal, copper,



**Table 1.—Iran: Registered Companies by Type and Capital (1931–76)**

Type	Number of Companies	Registered Capital (Thousands of U.S. Dollars)	Average Registered Capital Per Co. (Thousands of U.S. Dollars)
Agricultural .....	1,098	260,352	237
Mining .....	524	132,532	253
Manufacturing .....	3,519	2,269,799	645
Construction .....	4,376	1,122,763	257
Trading .....	7,497	1,068,820	143
Transport .....	705	120,690	171
Credit & Finance .....	2,421	529,755	219
Service .....	1,578	138,719	88
Others .....	83	6,906	83
Total .....	21,801	5,650,336	259

<sup>1</sup> Average registered capital of all firms.

Exchange: \$1.00 = Rls. 69.5

Source: Echo Economic Survey, Aug. 1976.

and iron ore mining and electric power generation facilities. During the 1970's, almost one-fourth of all capital investment in industrial establishments was being undertaken directly by the Government. The large state-owned holding company, the Industrial Development and Renovation Organization (IDRO) has 85 manufacturing plants under its control. IDRO controls companies in a wide variety of activities, from smelting aluminum to assembling metal and wooden office furniture. The capital investment of all IDRO companies is approximately \$4 billion.

Another larger user of business equipment in the mid-1970's was National Iranian Oil Company (NIOC) which employed over 30,000 people. The NIOC is one of the most advanced users of business equipment and systems in the country. The NIOC's Computer Application Division uses sophisticated computer systems for planning of exploration, production, and engineering projects and for the collection of geological and seismic data as well as for finance and business functions. The Division's computer, an IBM 370/158, is located in Abadan and is linked to remote terminals in Ahvaz.

**Commercial Firms.**—In 1976 there were 296,000 retail and wholesale establishments employing a total of 430,000 people. Most small retailers do not use cash registers or other types of business equipment, and only recently has the use of the abacus been dropped in favor of the electronic calculator. Large retail outlets, which were becoming more prevalent in the mid-1970's, typically did have cash registers, typewriters, and electronic calculators. One retailer, Hotco, an appliance distributor employs an NCR (U.S.) computer system for payroll, accounts, invoicing, and inventory control. Total sales turnover in retail and wholesale establishments in Iran was

\$7 billion in 1975, with a gross value added of some \$1.2 billion. Despite the large number of firms and the high amount of sales turnover, this category of firm accounted for only 14–18% of all business equipment purchases.

There were 22,000 import-export firms in Iran in 1976, all of which used business and office equipment. Each of these firms purchased an average of \$700 to \$900 worth of business equipment annually in the mid-1970's. This segment of commercial activity accounted for 17% to 19% of all business equipment demand. Although none of these companies had installed computers by 1976, typewriters, check-making equipment, telexes, and calculating machines were in wide use.

Iran's two leading newspaper publishers, Kayhan Publishing Group and Ettela'at Group of newspapers have both installed computerized typesetting equipment. Kayhan also employs IBM equipment for accounting, payroll, and statistical analysis.

**Health Care.**—Hospitals, clinics, and laboratories operated by private and charitable groups represent a growing category of business equipment users. Most of these organizations employ standard equipment for administrative and accounting purposes. The use of computerized billing and accounting systems in hospital facilities was in the embryonic stages as of 1976; at least one major private hospital had attempted using and then discarded such a system, while another was considering employing a computerized accounting and billing system. The Pahlavi Medical Library in Tehran installed a computerized medical information system in 1976. The system employs a Hewlett-Packard Corporation (U.S.) terminal which is linked with the U.S. National Medical Library in Bethesda, Md., U.S.A.

**EDP Service Bureaus.**—There are only few private EDP Bureaus in Iran. Most computer suppliers in Iran have their own service bureaus. There were seven EDP bureaus operating in Tehran in 1976:

- Computer System Design Services
- Dec-Punch Services Co.
- Data Economy
- Computer Automation
- Vijad Company
- Computer and Mechanized Systems Inc.
- Castaca Company

The largest service bureau is Dec-Punch Company which has rented an IBM 370/115 with 96K core capacity. The compilers are compatible with Cobol, Assembler, Fortran IV, RPG II, and PL/1. Dec-Punch was considering upgrading mainframe capacity to 160K and adding two IBM 3340 disc drives to the two already in use. The firm employs a staff of 65 including 10 expatriates.

Dec-Punch offers all types of computer services including scientific, commercial, and engineering consultancy, systems programing, recruitment and training of data processing staff, keypunching, and computer time-sharing.

## Financial Institutions

Iran's financial community consists of commercial, development, and other specialized banks, nonbanking financial and credit institutions, representative offices of foreign banks, insurance companies, and a growing stock market. With the exception of the

Russo-Iran Bank, which is totally owned by the Government of the U.S.S.R., foreign investment in Iranian banks has been limited to 40%. The money and capital market has developed rapidly since the establishment of the Tehran Stock Exchange in 1968. The Exchange deals in stocks, bonds, government securities, treasury bills, loan issues, and land development tenders. The implementation of the law for expansion of industrial ownership will eventually result in over 300 firms being listed.

In 1975, Iran's 36 banks had 58,483 employees in their central offices and 7,160 domestic branches. Thirty-three banks were headquartered in Tehran

*Table 2.—Iran: Major Iranian Banks in 1975*

Commercial Banks (All addresses Tehran)	Year of Establish- ment	Issued Capital (Millions of U.S. Dollars)	Ownership (Percent)		Employees	No. of Branches
			Iranian	Foreign		
Bank of Tehran, Pahlavi Ave. (Paribas International, Paris) .....	1952	11.4	65	35	2,405	252
Bank Omran, Istanbul Ave. ....	1946	10.6	100	—	1,932	251
Bank Etebarat Iran, 50 Sevom Esfand Ave. (Credit Lyonnais, Paris) .....	1958	9.9	60	40	979	70
The Foreign Trade Bank of Iran, Saadi Ave. (Bank of America) .....	1958	9.9	60	40	253	19
Distributors Cooperative Credit Bank, Ferdowsi Ave. ...	1959	8.5	100	—	1,287	139
Russo-Iran Bank, Behesht Ave. (State Bank of the U.S.S.R.) .....	1924	8.5	—	100	121	2
Bank Bazargani Iran, Sepah Sq. ....	1949	7.1	100	—	2,802	221
Mercantile Bank of Iran and Holland, 170 Saadi Ave. (Algemene Bank Nederland NV) .....	1959	7.1	65	35	545	22
Bank Pars, Takhte-Jamshid Ave. ....	1952	7.1	100	—	1,769	211
Bank Bimeh Iran, Saadi Ave. ....	1958	5.7	100	—	463	36
The Bank of Iran and the Middle East, Berlin St. (The British Bank of the Middle East) .....	1959	5.7	60	40	429	19
The Irano British Bank, Saadi Ave. (The Standard and Chartered Banking Group Ltd., London) .....	1958	5.7	60	40	472	18
Bank Melli Iran, Ferdowsi Ave. ....	1928	227.0	100	—	15,720	1,436
Bank Shahriyar, Sepahbod Zahedi Ave. ....	1973	71.0	100	—	377	19
Bank Saderat Iran, Shah Abbas Ave. ....	1952	42.6	100	—	11,230	3,000
Bank Sanaye Iran, 106 Sepahbod Zahedi Ave. ....	1973	42.6	100	—	516	6
Bank Dariush, Karim Khan Zand Ave. (Continental Bank of Chicago) .....	1974	28.4	65	35	193	6
International Bank of Iran Pahlavi Ave., (Chase Manhattan) .....	1975	28.4	65	35	N.A.	1
Irano Arab Bank, Villa Ave. ....	1975	28.4	66	33	N.A.	3
Bank Sepah, Sepah Ave. ....	1925	21.3	100	—	5,512	554
Bank Kar, Hafeez Ave. ....	1958	14.6	100	—	222	3
Bank Refah Karagaran, Roosevelt Ave. ....	1960	14.2	100	—	1,119	70
The International Bank of Iran and Japan, 750 Saadi Ave. (Bank of Tokyo) .....	1959	14.2	65	35	575	39
Iranians' Bank, Takhte-Jamshid Ave. (Citibank, N.Y.) ..	1959	14.2	65	35	325	8
<b>Special Banks</b>						
Bank Markazi Iran .....	1960	354.6	100	—	2,021	1
Agricultural Cooperative Bank of Iran, Varzesh Ave., Tehran .....	1933	299.0	100	—	3,512	206
Bank Rahni Iran, Ferdowsi Ave., Tehran .....	1938	142.0	100	—	1,072	151
Industrial & Mining Development Bank of Iran, Shiraz Ave., Tehran .....	1959	89.5	85	15	191	1
Bank Sakhteman, 164 Elizabeth Boulevard II, Tehran ..	1974	85.2	100	—	65	1
Industrial Credit Bank, Ateshkadeh Ave., Tehran .....	1956	61.3	100	—	283	1
Agricultural Development Bank of Iran, 23 Takhte- Jamshid Ave., Tehran .....	1968	56.8	100	—	310	9
Bank Iranshahr, Baharestan Sq., Tehran .....	1958	42.6	100	—	1,635	380
Development and Investment Bank of Iran, Sepahbod Zahedi Ave., Nasser St., Tehran .....	1973	29.8	78	22	72	1
Development Bank of Azarbayjan, Tabriz .....	1975	14.2	100	—	26	1
Development Bank of Khazar Rasht .....	1975	14.2	100	—	30	1
Development Bank of Khuzestan Ahvaz .....	1975	14.2	100	—	20	1

Source: Iran Banking Almanac 1975, Central Bank of Iran Statistics 1975, trade interviews.



and three new regional development banks had been established in the cities of Tabriz, Rasht, and Ahvaz (see tables 2 and 3). The registered capital of all banks in 1975 was \$1.7 billion and consolidated assets as of March 20, 1976 were \$33.6 billion, up from \$25.2 billion on March 20, 1975 (see table 4). Although they employ less than 1% of the total Iranian work force, banks are heavy users of business equipment and purchased over 13% of such equipment in 1975. In addition, 25% of all computer installations in Iran were in banks in 1975.

**Bank Markazi Iran.**—This is the Central Bank of Iran. It is wholly owned by the Government and is the main repository for government funds. Formed in 1960, it is responsible for the stabilization of the rial, the issuance of notes and coins, the formulation and implementation of monetary and credit policies, maintenance of accounts of ministries and government agencies, encouragement of industrial and agricultural expansion and national representation at the Industrial Monetary Fund and in international transactions. As of March 20, 1976, the balance sheet of Bank Markazi Iran showed assets of \$18.7 billion. In the 1970's, the bank played a leading role in the introduction of modern banking procedures, both by innovations made in its own operations and by

**Table 3.—Iran: Foreign Bank Representative Offices**

ABECOR (Associated Banks of Europe)	
Algemene Bank Nederland N.V. ....	Netherlands
Banque de Bruxelles Lambert S.A. ....	Belgium
Bayerische Hypotheken und Wechsel Bank ....	West Germany
Dresdener Bank AG ....	West Germany
Oesterreichische Laender-bank ....	Austria
100 Ave. Villa, Tehran	
Banca Commerciale Italiana ....	Italy
272 Pahlavi Ave., Tehran	
Bank of America ....	United States
Besrouke Bldg.	
Takhte-Jamshid at Forsat Ave., No. 41—7th Floor, Tehran	
Bank of Tokyo Ltd. ....	Japan
No. 57, Takhte-Jamshid,	
The International Bank of Iran and Japan Building, Tehran	
Bankers Trust Company ....	United States
6 Karim Khan Zand Ave., Tehran	
Banque Nationale de Paris ....	France
Abbasabad-Roosevelt Crossing	
Daftar Machine Building, Tehran	
Banque de Paris et des Pays-Bas ....	France
311, Avenue Iran Novin, Tehran	
Banque Rothschild ....	France
152 Avenue Shah-Reza, 4th Floor, Tehran	
Barclays Bank Ltd. ....	England
7th Floor—Bezrouke House Corner, Forsat/Takhte-Jamshid Ave., Tehran	
Bayerische Vereins Bank Munich ....	West Germany
38 Zahed Street, Tehran	
Berliner Bank AG. ....	West Germany
Vereins und Westbank AG. ....	West Germany
38 Zahed Street, Tehran	

**Table 3.—Iran: Foreign Bank Representative Offices**  
—Continued

Brandt Ltd. ....	England
Grindlays Bank Ltd. ....	England
10 Razi Street, Avenue Shah Reza Tehran	
The Chase Manhattan Bank ....	United States
135 Kheradmand-e-Shomali	
Kaf Rang Building, First Floor	
Tehran	
Commerz Bank AG. ....	West Germany
13 Ave. Karim Khan Zand	
Tehran	
Credit Lyonnais ....	France
6 Boulevard Karim Khan-e-Zand,	
8th Floor, Tehran	
Deutsch Bank AG. ....	West Germany
Ave. Karim Khan Zand, AEG Building, Tehran	
The First National Bank of Chicago ....	United States
38 Elibabeth Boulevard II	
Tehran	
Citibank ....	United States
37 Darya-e-Noor Street,	
Third Floor, Tehran	
The Fuji Bank Limited ....	Japan
37 Darya-e-Noor Street,	
Takhte-Tavous, Tehran	
Inter-Alpha Group of Banks	
Berliner Handels-Und Frankfurter Bank ....	Germany
Credit Commerciale de France ....	France
Krediet Bank Bruxelles ....	Belgium
Nederlandsche Middenstands Bank, N.V. ....	Netherlands
Privat Banken A/S ....	Denmark
Williams and Glyn's Bank, Ltd. ....	England
Abbasabad Ave., Roosevelt Crossing, Daftar Machine Bldg., 6th Floor, Tehran	
Korea Exchange Bank ....	Korea
199 Bisto Panj-e-Shahrivar Ave., Tehran	
Lloyds Bank International Ltd. ....	England
199 Bisto Panj-e-Shahrivar Ave., Tehran	
Manufacturers Hanover Trust Co. ....	United States
55 Kakh Shomali, Tehran	
Morgan Grenfell & Co. Ltd. ....	England
Kaf Rang Building, 8th Floor,	
135 Kheradmand-e-Shomali, Tehran	
Midland Bank Group ....	United States
211 Iranshahr Ave., Corner of Karim Khan-e-Zand, Tehran	
The Philadelphia National Bank ....	United States
6 Karim Khan-e-Zand Ave., Tehran	
Societe Generale ....	France
Boulevard Elizabeth II,	
Koutcheh Said, Meli Sakhteman Bldg., 5th Floor, Tehran	
Swiss Credit Bank ....	Switzerland
19 Sepahbod Zahedi Ave., Kaveh Building, Tehran	
The Sumitomo Bank Ltd. ....	Japan
55 North Kakh Ave., Tehran	
Union Bank of Switzerland ....	Switzerland
571 Pahlavi Ave., Corner of Takhte-Tavous, Tehran	
Swiss Bank Corporation ....	Switzerland
Sepahbod Zahedi Ave., Naser 4+6, 2d Floor, Tehran	

Source: Iran Banking Almanac 1975 and trade sources.

**Table 4.—Iran: Consolidated Balance Sheet of the Banking Industry<sup>1</sup>**  
(in millions of U.S. dollars)

	1969/ 1970	1973/ 1974	1974/ 1975	1975/ 1976
<b>Assets</b>				
Gold .....	132.0	157.3	163.4	170.1
Subscription minus utilization from the IMF .....	(38.3)	28.9	38.6	60.6
Subscription and shares in international organizations ..	10.6	11.5	25.3	25.1
Foreign exchange .....	275.9	2,203.5	7,852.0	7,937.0
Total foreign assets .....	380.2	2,401.2	8,079.3	8,192.8
Claims on the Government ..	1,803.3	3,555.6	3,970.6	4,832.9
Claims on public corporations and agencies .....	137.3	750.4	2,653.0	4,407.0
Total claim on the public sector .....	1,940.6	4,305.9	6,623.6	9,239.9
Claims on the private sector ..	3,038.9	7,131.3	10,466.4	16,156.5
Total assets .....	5,359.7	13,838.4	25,169.3	33,589.2
<b>Liabilities</b>				
Money .....	1,285.8	2,925.0	4,860.4	6,603.1
Quasi-money .....	1,825.7	4,518.0	7,173.2	10,337.2
Government deposits .....	253.5	2,597.4	4,376.1	6,422.7
Deposits on public corporations and agencies .....	501.7	431.5	1,332.4	1,295.5
Total public sector deposit ..	755.1	3,028.9	5,708.6	7,718.1
Capital account .....	587.5	1,176.0	2,293.5	3,108.5
Foreign loans, deposits and credit .....	562.4	855.7	1,270.1	2,148.8
Import registration deposits ...	99.0	376.6	328.3	417.0
Advance payments on letters of credit .....	70.0	443.0	2,351.5	1,472.9
Other .....	174.3	515.2	1,183.9	1,783.5
Total liabilities .....	5,359.7	13,838.4	25,169.3	33,589.2

<sup>1</sup> Iranian fiscal years run from March 21 to March 20.

sponsoring numerous specialized employee training programs for other Iranian banks.

**Commercial Banks.**—Consolidated assets of Iran's 24 commercial banks as of March 20, 1976 were \$25.5 billion, up from \$17.4 billion on March 20, 1975. As of March 20, 1976 Bank Melli Iran (the National Bank of Iran), with total assets of \$7.7 billion, 1,551 branches in Iran and 27 branches abroad and some 16,000 employees, was by far the largest commercial bank in the country. Bank Melli made many improvements in its operations between 1970 and 1975. In 1976 it maintained two IBM model 370/135 computers in its Data Processing Department in Tehran. The Tabriz branch handled the transactions of accounts for 27 surrounding branches on NCR Corp. (U.S.) Century computers; checking account transactions in the Shiraz area were handled on five NCR model 399 minicomputers and savings accounts of widely dispersed branches such as Kerman, Arak, Qom, and Kashan are transferred to Tehran on a daily basis. In early 1976 Bank Melli completed installation of an IBM 370/115 computer in Khuzistan and was installing a similar system in Mashhad. The bank also added 269 NCR teller machines in 133 branches in 1975.

Only one bank in Iran, the Bank of Iran and Holland, provides computerized daily savings and checking statements. There are no bank clearing houses and checks have to be cashed at the particular branch office where the check is drawn. Outside of four or five large banks, there is little automation in banking practices. The Bank of Tehran purchased two remote teller terminals for its branch offices in 1972 but this system was plagued with problems and equipment was removed from service. The banking system itself has only been slightly modernized since the late 1960's. The Iranian Bankers Association (49 Daryaye Noor St., Takhte Tavooos Ave., Tehran) has been active in developing and supporting a number of projects to modernize the banking system, including training, standardization, and the development of mechanized central clearing.

Commercial bank rates for short-term loans are high, and while development banks made some medium-term loans for specified projects, there are no long-term commercial credits available in Iran. Commercial banks require high collateral, and secured personal guarantees are also often required even for loans to corporations.

Outside of the banking system, money lenders and commercial paper discounters are numerous in the commercial areas and bazaars of every Iranian city. Notes payable are commonly used. Discounted short-term notes are often rediscounted several times. Interest rates by these lenders are high, but for many businessmen the bazaar money market represents a highly liquid form of investment with high returns for excess funds.

**Insurance Companies.**—There were 15 insurance companies established in Iran in 1976 (see table 5). These firms employed approximately 2,500 people and had registered capital of \$1.2 billion. From March 1973 to March 1975, insurance premiums collected tripled to over \$235 million annually. Over 57% of all premiums were for marine cargo insurance followed by automobile insurance at 20.3%. Life insurance made up only 2.8% of all premiums while homeowners, accident, and other miscellaneous insurance made up the remainder of all premiums. Insurance companies purchased over 4% of all business equipment sold in Iran. By the beginning of 1976 two of the insurance companies had purchased computer systems. These systems were used primarily for payroll and accounting purposes. The use of such systems for monitoring premiums and policies and for actuarial work had not yet begun.

## TRENDS, PROGRAMS, AND PROJECTS

During the early 1970's requirements for more advanced business equipment developed rapidly in



Table 5.—Iran: Insurance Companies, 1976

Company	Year Est.	Registered Capital (thousands of U.S. dollars)
Yorkshire Insurance .....	1929	N.A.
Ingotrakh Insurance .....	1931	N.A.
Iran Insurance Company .....	1935	2,960
Sharq Insurance Company .....	1950	1,481
Arya Insurance Company .....	1952	1,480
Pars Insurance Company .....	1955	740
Melli Insurance Company .....	1956	900
Alborz Insurance Company .....	1959	1,480
Asia Insurance Company .....	1959	740
Omid Insurance Company .....	1960	810
Construction Labor Insurance Company .....	1964	740
Dana Insurance .....	1974	7,400
Hafeez Insurance Company .....	1974	14,800
Iran-America International Insurance Company .....	1975	14,800
Gras Savoye Iran .....	1975	N.A.

Source: Trade interviews.

Iranian businesses and government agencies. The lower prices of electronic calculators led to their increased use by almost all segments of the business community. Persian script typewriters have been in the market for many years, but the development of Persian script printout and display screens for computers, and the development by IBM of a Persian mag-card typewriter, have made this equipment better adapted to the general business needs of the country. These developments, coupled with plans to computerize most government departments, led to more rapid sales in the mid-1970's. Strict requirements by the Ministry of Finance for more accurate bookkeeping and the resulting need for firms to employ qualified accountants greatly increased the use of calculators and statistical machines. The influence of the many foreign companies established in Iran has convinced many Iranian companies of the value of more modern business operations. Firms such as NIOC and various banking institutions with long histories of exposure to foreign business and managerial practices were leading purchasers of advanced business equipment.

A major trend has been the growth of computer systems in Iran (see table 6). In 1970 there were 63 installed computers, by 1976 there were 290. It is projected that by 1980 computer installations in the country should be about 500. The majority of computer applications involved batch processing of business and commercial type data; there was only very limited use of data base management systems.

Most computer systems in Iran are used for payroll and accounting functions. A shortage of trained programmers coupled with the high cost of specialized programs have restricted the development of more sophisticated applications. In 1975 there were an estimated 350 experienced programmers in the

Table 6.—Iran: Computer Placements, 1975

Banks	Type of Computer
Agricultural Cooperative Bank .....	IBM 3
Bank Bazargani .....	IBM 370/20
	IBM 370/115
Bank Bimeh .....	NCR 399
Bank Dariush .....	NCR 399
Bank Iranshahr .....	NCR 200
Bank Markazi Iran .....	IBM 370/135
Bank Melli Iran .....	3 IBM 370/135 systems
Bank Omran .....	NCR Century 201
	NCR 399
Bank Pars .....	NCR 100
Bank Rahni .....	IBM 370/125
Bank Refah Kargaran .....	IBM 370/115
Bank Saderat .....	IBM 370/145
Bank Sanaye Iran .....	Burroughs L 2000
	Burroughs L 5000
Bank Sepah .....	IBM 370/135
Bank Tehran .....	IBM 370/125
Distributor's Cooperative Credit Bank .....	Burroughs L 6150
International Bank of Iran .....	IBM 3
Mercantile Bank of Iran and Holland .....	IBM 3
International Bank of Iran & Japan .....	Burroughs L 6000
Industrial Credit Bank .....	Burroughs L 5000
Iranians Bank .....	NCR 399
<i>Educational Centers</i>	
Aryamehr University .....	CDC Cyber 74
Azabadegan University .....	IBM 3
Civil Aviation School .....	Digital P.D.P. 8-E
College of Commerce .....	IBM 3
College of Science and Industry .....	IBM 3
Esfahan University .....	IBM 3
Ferdowsi University .....	IBM 135
Free University .....	Data General C/300
	Eclipse
Industrial Management Institute .....	IBM 3
Jondi Shahpur University .....	IBM 3
Melli University .....	IBM 3
Polytechnic College .....	IBM 370/115
Teacher Training College .....	IBM 370/115
Tehran University .....	IBM 370/135
Pahlavi University .....	IBM 370/135
<i>Utilities</i>	
Ahvaz Water and Power Organization .....	IBM 370/135
Esfahan Water and Power Organization .....	IBM 370/115
Mashhad Water and Power Organization .....	IBM 370/115
Mazandaran Water and Power Organization .....	IBM 3
Tehran Electric Organization .....	IBM 370/145
Tehran Water Organization .....	IBM 370/145
<i>Insurance</i>	
Asia Insurance Company .....	Burroughs L 5000
Insurance Company of Iran .....	IBM 370/115
<i>Government Ministries and Agencies</i>	
Esfahan Communication Department .....	General Automation SPC 16
Evaluation Organization .....	IBM 3
Geological Organization .....	Honeywell 658
Industrial Development and Renovation Organization .....	IBM 3
Institute of Statistics and Informatics .....	IBM 3
Ministry of Agriculture .....	Univac 1110
	Univac 9300
	Honeywell 658
Ministry of Education .....	IBM 370/125
Ministry of Finance .....	IBM 370/125
Ministry of Energy .....	IBM 370/115
Ministry of Health .....	IBM 3
Ministry of Labor and Social Welfare .....	IBM 370/125
Ministry of Post, Telephone and Telegraph .....	Honeywell 6025
Ministry of Roads .....	IBM 370/145
Plan and Budget Organization .....	IBM 370/158
Social Insurance Organization .....	IBM 370/125
Statistical Center of Iran .....	IBM 370/145
Tehran Municipality .....	IBM 370/125
Weather Bureau .....	IBM 1130

**Table 6.—Iran: Computer Placements, 1975—Continued**

<i>Industrial and Commercial Companies</i>	<i>Type of Computer</i>
Aliaf Company .....	IBM 3
Arj Corporation .....	IBM 370/125
Azmayesh Company .....	NCR 395
Dopar Industries .....	IBM 3
Bristol Iran .....	IBM 3
Computer and Mechanized Systems Co. ....	IBM 370/125
Dashte Morghab Co. ....	Burroughs L8
Ettela'at Newspaper .....	Linotron 505C
Fars and Khuzistan Cement Companies ....	IBM 7
	IBM 3
General Motors Iran .....	IBM 3
General Tire Iran .....	IBM 370/115
Hamarac Company .....	IBM 3
Hotco .....	NCR 395
Iran Air .....	IBM 370/158
	Raytheon 1021
Iran Bicycle and Motorcycle Manufacturing Company .....	Burroughs L 8000
Iran National Industries .....	IBM 360/20
	IBM 360/125
Iran Vich Company .....	IBM 3
Jahan Company .....	IBM 3
Khavar Manufacturing Company .....	IBM 370/125
Melli Industrial Group .....	IBM 370/125
National Iranian Gas Company .....	CDC Cyber 72
National Iranian Oil Company .....	IBM 370/158
National Iranian Radio and Television ....	Honeywell 658
Philver Company .....	IBM 3
Soliran Company .....	Data General 840
Tadbir Snaat Consulting Engineers .....	IBM 370/115
	IBM 3
Tobacco Organization .....	NCR Century 100
Wien Shoe .....	Burroughs L 9000

Source: Trade interviews.

country and only 3,000 people were employed directly on computer functions.

The absence of remote computer terminals has limited the growth of time-sharing in Iran. Also, even though users tend to purchase much larger capacity than they will need, few will share time with other firms. There were seven EDP service bureaus in operation in 1977. Most are small with limited equipment and manpower. Less than 10% of total computer usage time was for time sharing.

There are a number of computer training schools in the country. Specialized programming courses, however, do not exist. While some training programs are run by government organizations like the National Iranian Oil Company for their own employees, flourishing private schools also graduate 4,000 to 4,500 computer trainees yearly. Computer Services Company, for example, trains 2,000 students per year in basic keypunch techniques and computer language. Most suppliers also operate closed training programs for customer personnel.

**Programs and Projects.**—A key point in Iran's development plans is administrative reform and efficiency. In a speech in the early 1970's, the Shah suggested that more computers be used in Iran to increase the efficiency of tax collection, provide timely statistical information, and as an aid in building a modern industrial society. Under the Fifth Development Plan (1973/74–1977/78) administrative policy

emphasizes decentralization and administrative efficiency, as well as the strengthening of regional and local administration. The revised Fifth Plan allocated \$52 million for general administration, \$63 million for financial administration, and \$81 million for statistical and technical services.

The Government's objectives include shifting the operational functions of government offices from Tehran to provincial offices and departments, and emphasizing the staff and coordination functions of central offices. Provincial governments are to be given greater technical and administrative capability with increased financial and manpower resources, and greater authority to develop, coordinate, and supervise local projects. The Government proposes to introduce improved management systems into the departments, and to increase the effectiveness of planning and budget systems. A key thrust is the improvement and expansion of information gathering, storage and retrieval systems, through personnel training, and use of computers, earth satellite stations, and data banks. Plans include development of climatological and meteorological data, industrial and agricultural statistics, minerological information and maps, as well as vital statistics and census data.

The Plan and Budget Organization (PBO) has initiated a project to link up all government organizations to its data base by the early 1980's. In order to accomplish this, each agency must either have a terminal linkup or its own computer, which must be compatible with the IBM system in use at the PBO. By 1980, the PBO's core capacity should be increased to 10 megabytes. While the supplier for the expansion of the main frame computers at the PBO will be IBM, the PBO will be open to competitive suppliers for minicomputers. During the Sixth Plan period starting in 1978, the PBO's budget for the computer section will be some \$2 million.

Other Government organizations with plans to invest in new or expanded computer capabilities during the 1976–80 period include the Ministry of Post, Telephone and Telegraph (PTT), the Weather Bureau, and National Iranian Radio and Television. The Ministry of PTT has budgeted for the purchase of a Honeywell "Mass Memory" unit which is to be delivered in 1980. The Iranian Weather Bureau will be taking delivery of a Honeywell 6000 in 1977.

The Iran National Tourist Organization (INTO) plans to install a computerized reservation system for its hotel network and this is expected to result in the installation of terminal facilities and smaller computer systems in the country's hotels.

In 1976 some 19 firms representing the manufacturing, transportation, banking, printing and publishing, and service industries were planning to purchase computers or expand existing capacity during





*The Shah and Empress of Iran visit the newly completed, U.S.-designed computerized agricultural data center in Tehran.*

the 1976-80 period. Of these firms, nine wanted computers for installation in 1976-77. The remaining 10 firms were thinking of purchasing a computer in the 1978-80 period. In terms of brands, nine firms had already decided to buy an IBM computer. These firms included such diverse companies as Khavar Company, a manufacturer of trucks; Pak Dairy Company, a milk producer; The Bank of Tehran and the Bank of Iran and Holland. Other company preferences included three firms interested in NCR 399 computers and one firm interested in a CDC computer system. Six companies had not indicated a preference and were looking at a number of suppliers in 1976 in order to obtain equipment that would best suit their particular needs

### **GROWTH PROSPECTS**

Use of general business equipment is expected to undergo strong growth during the 1976-80 period and beyond, as government employment expands rapidly. By 1980 there should be approximately 1.4 million government workers in Iran. The administrative budget for 1975 was \$590 million; in 1976 the amount was increased to \$650 million. Projections

are for continued expansion as the Government moves to decentralize the concentration of government agencies in the capital city.

Industrial output grew at a rate of 19% annually from 1970 to 1975. The industrial sector is expected to continue to expand through the 1980's in terms of both the number of companies operating and output. The number of people employed by industry numbered under 2 million people in 1975 and is projected to rise to approximately 2.8 million by the end of 1980. The number of registered companies, both commercial and industrial, should continue to increase steadily. It is forecast that from 1976 through 1980, 17,000 to 20,000 new companies will be registered. The use of computers and peripheral equipment should continue to grow as more industrial companies begin to see the value of their purchase. The period 1975 through 1985 is projected as a decade of real industrial expansion in the country; preliminary figures for 1976 showed industry overtaking agriculture as the number one component of gross domestic product for the first time in Iranian history.

Continuing growth in the use of business equipment and computers should be assured by the rapid

rise of industrial activity, tighter government controls, high wages for employees, and constant expansion of Government. It is expected that forces in the market place, high costs for raw materials, and increasing tax rates will force almost all companies to modernize operations by 1985. Certain progressive firms such as the Bank of Iran and Holland and the Arj Company will make other companies look to them for innovations in business systems use. A 1976 government regulation permitted the use of photocopies in legal transactions (formerly only original documents were permitted) and the expected establishment in the late 1970's of a bank clearing house will greatly spur the employment of microfilm and microfiche systems, computers, and other types of electronic banking equipment.

## CAPITAL GOODS MARKET

Iranian imports of business equipment and systems in 1975 totaled about \$91 million. Except for Iranian manufacture of office furniture and some supplies, the total demand for business equipment is supplied by imports. Imports rose at an average rate of about 60% annually during the 1973-75 period. The market was dominated by U.S. suppliers who made total sales of \$31.4 million in

1975, representing 34.5% of the total import market that year (see table 7).

U.S. suppliers dominated the market for computer and peripheral equipment in 1975 providing 96% of Iran's imports in this category, and were very strong in sales of accounting and statistical machines as well. These two categories of office machinery made up 27% and 49%, respectively, of total U.S. business equipment exports to Iran in 1975. West German suppliers were second to United States firms with sales of \$17 million or 18.8% of the import market in 1975. Over 40%, by value, of West German business equipment imports into Iran were typewriters, a large portion of which were from the German subsidiary of a U.S.-based multinational firm. Growth of the market will level off considerably during the 1976-80 period at about 16% per annum, with total imports projected to reach \$166 million in 1980.

In the 1960's, large firms from the United States, West Germany, and Britain completely dominated their respective lines in the Iranian business equipment market. Sales became much more competitive in the early 1970's as a number of suppliers, mainly from the Far East, began making large sales of small electronic and mechanical office products. Since 1970 suppliers from Taiwan, Hong Kong, and Singapore have used aggressive and successful sales techniques

*Table 7.—Iran: Size of the Market for Business Equipment and Systems*  
(in thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>COMPUTERS &amp; PERIPHERAL EQUIPMENT</b>					
Domestic Production .....	—	—	—	—	3,500
Imports .....					
United States .....	5,545	4,970	8,380	9,389	9,000
United Kingdom .....	260	210	240	—	—
Italy .....	—	—	75	—	—
Total .....	5,805	5,180	8,695	9,564	10,700
Exports .....	—	—	—	—	—
Market Size .....	5,805	5,180	8,695	9,564	14,200
<b>ACCOUNTING AND STATISTICAL MACHINES</b>					
Domestic Production .....	—	—	—	—	—
Imports .....					
United States .....	1,837	10,378	15,352	18,420	27,000
West Germany .....	2,948	2,791	4,300	—	—
United Kingdom .....	1,990	2,324	2,198	—	—
Italy .....	1,891	1,981	3,190	—	—
Sweden .....	735	1,038	1,068	—	—
Others .....	3,231	7,109	6,142	—	—
Total .....	12,632	25,621	32,250	36,300	53,100
Exports .....	—	—	—	—	—
Market Size .....	12,632	25,621	32,250	36,300	53,100
<b>COPYING AND DUPLICATING EQUIPMENT</b>					
Domestic Production .....	—	—	—	—	—
Imports .....					
United States .....	571	943	1,280	1,620	3,400
West Germany .....	1,598	2,072	2,719	—	—
United Kingdom .....	2,332	1,589	2,703	—	—
Japan .....	166	1,135	1,460	—	—
Others .....	655	3,603	7,163	—	—
Total .....	5,322	9,342	15,325	21,130	37,000
Exports .....	—	—	—	—	—
Market Size .....	5,322	9,342	15,325	21,130	37,000



**Table 7.—Iran: Size of the Market for Business Equipment and Systems—Continued**  
(in thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>TYPEWRITERS/CHECKWRITERS</b>					
Domestic Production .....	—	—	—	—	—
Imports .....					
United States .....	34	45	50	90	200
Italy .....	80	118	3,175	—	—
West Germany .....	1,980	3,724	7,257	—	—
Netherlands .....	193	469	2,241	—	—
Japan .....	202	169	278	—	—
Switzerland .....	309	259	809	—	—
Others .....	480	437	1,168	—	—
Total .....	3,278	5,221	14,978	16,267	23,800
Exports .....	—	—	—	—	—
Market Size .....	3,278	5,221	14,978	16,267	23,800
<b>OTHER OFFICE EQUIPMENT (INCLUDING MACHINES, STAPLERS, POSTAGE METERING AND DICTATING EQUIPMENT, ETC.)</b>					
Domestic Production .....	2,750	3,300	5,210	7,350	12,700
Imports .....					
United States .....	950	2,187	6,390	5,110	5,500
West Germany .....	1,725	2,529	2,805	—	—
United Kingdom .....	1,843	1,746	3,015	—	—
Japan .....	139	252	334	—	—
Others .....	2,830	4,314	7,202	—	—
Total .....	7,487	11,028	19,746	23,695	41,400
Exports .....	8	4	2	—	—
Market Size .....	10,229	14,324	24,954	31,045	54,100
<b>TOTAL BUSINESS EQUIPMENT MARKET</b>					
Domestic Production .....	2,750	3,300	5,210	7,350	16,200
Imports .....					
United States .....	8,937	18,523	31,452	34,629	45,100
West Germany .....	8,251	11,116	17,081	—	—
United Kingdom .....	6,425	5,869	8,156	—	—
Japan .....	507	1,556	2,072	—	—
Others .....	10,404	19,328	32,233	—	—
Total .....	34,524	56,392	90,994	106,956	166,000
Exports .....	8	4	2	—	—
Market Size .....	37,266	59,688	96,202	114,306	182,200

<sup>1</sup> Estimates

Source: United Nations, Organization for Economic Cooperation and Development, supplier country, and official Iranian trade statistics; estimates based on trade interviews.

to sell small electronic calculators and similar business equipment. In 1975 over 35% of Iran's total business equipment imports were sold by Far Eastern suppliers. One of the main reasons for this success has been price. However, in sales of computers, advanced banking equipment, and high speed copiers, western suppliers still dominated the market through the mid-1970's.

Iran's total imports of business equipment are expected to grow at an average annual rate of 13% during the 1975-80 period and amount to about \$166 million in 1980.

### Domestic Manufacturing

In the mid 1970's the only business equipment manufacturing done in Iran was of office furniture, safes, filing cabinets, and miscellaneous office supplies.

A project to assemble computer terminals is being formed by a joint venture between Iran Electronics Industries (IEI) and Control Data Corporation

(CDC) of the United States. CDC has a 40% equity at \$7.5 million in the joint venture, Computer Terminals Company of Iran, which is a subsidiary company of IEI. Production of the first units is scheduled to begin in 1978.

### MARKET OPPORTUNITIES

**Computers and Peripherals.**—Government development programs, the rising cost of labor, and a more competitive manufacturing atmosphere are all expected to contribute to an excellent market for computers and peripheral equipment through the early 1980's. The value of computer and peripheral equipment imports is expected to be over \$10 million in 1980 and the number of large and small computers sold is expected to grow to about 100 that year.

A limiting factor in the growth of computer use in the 1970's was the lack of personnel needed to operate the system. By the mid-1970's however, the

situation was improving, training was available in universities and commercial schools as well as from supplier companies. Through 1980, government agencies are expected to be the primary customers. The PBO's project to link up all government organizations with a central data bank will be a major contributor to increased sales. Government purchases will include computers, peripherals such as card readers, keyboard terminals, both with and without display features, disc and tape drives. The development of the PBO's integrated data system will require all types of equipment for data communication.

Private firms are expected to continue purchasing computers to improve accounting procedures, and to meet government requirements for more accurate business records. Increased business activity will necessitate the application of computers to management, inventory control, and specialized processing and business functions. Many businesses will purchase minicomputers because of their relatively uncomplicated operation and simplified programs. The banking industry is expected to be a major purchaser of small business computers. In 1976, 19 of the country's 34 banks had installed computers while the remainder had budgeted funds for computer acquisition over the next few years. The introduction of centralized bank clearing operations will result in further automation in the Iranian banking system.

There will be growing opportunities for sales of computer software. The critical shortage of programmers and analysts, as well as the general shortage of keypunch operators make procurement of software packages attractive. In the mid-1970's there was considerable overcapacity in computer processing capability. Many users who initially employed computers only for payroll and accounting purposes will be looking for more advanced applications of their equipment. Government agencies using the integrated data and information system are expected to purchase software packages for data storage and retrieval, statistical analysis, resource inventory and evaluation, mapping and, other specialized applications.

Computer timesharing was in its infancy in 1976, but improved telephone communications is expected to increase timesharing to about 25% of total usage by 1980. This will lead to opportunities for sales of various on-line and interactive software packages to government and business users.

**Electronic Calculating Machines.**—The Iranian market for low-priced, four-function calculators and small desk calculators had become saturated by 1976. Importers from Hong Kong, Japan, and Taiwan were the main suppliers. Programmable calculators for banks and other financial institutions are expected to have the highest growth potential through

the early 1980's. There should also be increased sales of hand-held calculators with scientific or statistical functions.

There is a good market for general business accounting machines, and for specialized banking types. However, it seems unlikely that Iranian banks will purchase other advanced banking equipment, such as remote tellers and terminals during the 5-year period 1976–81.

**Electric Typewriters.**—There are excellent prospects for increased sales of quality electric typewriters in Iran. Users of both English and Persian character machines are shifting from manual to electric equipment. There will also be increased sales of more advanced typewriter equipment such as mag-card machines, typewriter memory equipment, and specialized types such as court reporting typewriters.

**Copying and Duplicating Equipment.**—It is expected that there will be strong sales through 1980 of plain paper copying equipment with reducing capability. Offset office duplicators will also be purchased by a variety of government and private establishments for various in-house printing applications.

**Microfilm Equipment.**—In past years the low demand for microfilm equipment was the result of government regulations specifying that only original documents were admissible in courts of law. In 1976, the regulations were amended to permit admission of document copies as evidence in courts under certain circumstances. This is expected to result in increased purchases of microfilming equipment. Several government agencies will likely purchase complete systems for recording and storing large masses of data. Smaller microfilm systems are expected to be sold for recordkeeping by hospitals, clinics, schools, and businesses wishing to safeguard permanent records. Banks should also begin purchasing microfilm systems when the centralized bank clearing system is implemented in Iran. It is estimated that fiche-to-fiche duplicators will have high sales potential; fiche-to-jacket readers and automatic retrieval devices should also sell well.

**Other Business Equipment.**—Sales of mailing machines and automatic postal machines have been limited due partly to the fact that a long wait is required to obtain a permit for their sale from the central post office. There is a large but very competitive market for sale of other items such as postal scales, labelling equipment, and date marking machines.

Small office equipment such as staplers, paper punches, and laminating machines sold well in the mid-1970's, but competition was keen. Small quantities of paper shredders and other types of document destroying equipment were also sold. Sales of check canceling and check protecting equipment



were strong through the mid-1970's but manual rather than electric types were used.

## MARKETING ENVIRONMENT

### Buyers' Universe

The 1976 purchasers of business equipment in Iran included some 220 Iranian Government agencies, 490 industrial manufacturing companies, 260,000 small workshops, 22,000 import-export firms and 296,000 wholesale and retail establishments.

Government agencies usually procure business ing departments. Purchases of small items such as equipment requirements through their own purchas- typewriters are handled on a routine basis by the purchasing agency) normally is involved only in very major items—computer systems, for example—are made at the ministerial level. The Foreign Transactions Company (FTC—the quasi-governmental purchasing agency) normally is involved in very large purchases of equipment for governmentwide use.

Large industrial companies buy most business equipment through sales representatives established in Iran. Purchase decisions made in family-owned businesses are often highly centralized, and owners generally make most final decisions themselves.

Except for purchase of computers there has been little use made of consultants for the purchase of business equipment in Iran. In the mid-1970's, there were few office systems consultants established in Iran. One consultant firm, Kashani Company, was recently established in the field of office systems design. Another, Harding Company Ltd., offers planning, management, and financial services. Recently a number of large international management consulting firms have established representation in Iran, and there is expected to be a small but growing use of their services during the late 1970's. These firms will undoubtedly influence decisions for purchase of considerable business equipment and systems in the next few years (see Education and Training Services chapter).

### Foreign Suppliers' Universe

**Computers.**—In 1975, there were 12 companies selling computers in Iran (see table 8). Ten of the 12 had established Iranian subsidiary companies operating under their own names. Wang Laboratories, Inc. of the United States and MAEL S.p.A. of Italy were the only two still selling through Iranian distributors.

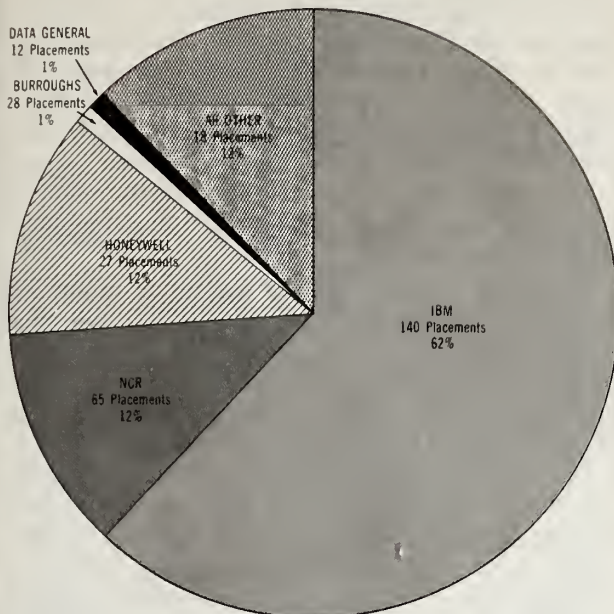
In 1975 IBM World Trade Corp. had 140 computer units installed in Iran, and was the leading supplier, accounting for 48% of placements and an estimated 62% of the total value. (see figure 1).

**Table 8.—Iran: Major Suppliers of Business Equipment and Systems**

<i>Computers</i>	
IBM .....	USA
Honeywell .....	USA
Sperry Rand .....	USA
NCR .....	USA
Wang Labs, Inc. ....	USA
Burroughs .....	USA
Digital Equipment ..	USA
Data General .....	USA
Interdata .....	U.K.
Mael .....	Italy
Raytheon .....	USA
Computer Vision .....	USA
<i>Photocopy Machines</i>	
IBM .....	USA
Rank Xerox .....	U.K.
Apeco .....	USA
U-Bix .....	Japan
Canon .....	Japan
Minolta .....	Japan
Rex Rotary .....	Sweden
Geha .....	Japan
GAF .....	USA
3M .....	USA
<i>Calculators</i>	
Victor .....	USA
Sharp .....	Japan
Texas Instruments ..	USA
NCR .....	USA
Qualitron .....	Taiwan
Monroe .....	USA
Sanyo .....	Japan
Toshiba .....	Japan
Casio .....	Japan
Ricoh .....	Japan
Canon .....	Japan
Sinclair .....	U.K.
<i>Typewriters</i>	
Triumph-Adler .....	West Germany
Royal (Litton Industries) ..	USA
IBM .....	USA
Olivetti .....	Italy
Sperry Rand .....	USA
Facit .....	Sweden
Olympia .....	West Germany
<i>Accounting &amp; Bookkeeping</i>	
NCR .....	USA
Burroughs .....	USA
<i>Microfilm</i>	
Eastman Kodak .....	USA
3M .....	USA
Canon .....	Japan
Bell & Howell Co. ....	USA
<i>Miscellaneous</i>	
Embossing Machines—Dennison Mfg. Co. ....	USA
Binding Equipment, cutters and punch—General Binding Corp. ....	USA
Cash Registers—NCR .....	USA
Cash Registers—Sweda .....	Sweden
Filing Systems—Kardex .....	USA
Telex Machines—Telex Corp. ....	USA
Telex Machines—Siemens .....	West Germany
Postage Mailing Equipment—Pitney-Bowes ..	U.K.
Dictation Equipment—IBM .....	USA
Duplicating Machines—A. B. Dick Co. ....	USA
Duplicating Machines—Gestetner .....	U.K.

Source: Trade Interviews.

Figure 1  
Iran: Market Share of Computer Suppliers by Value 1975



Note: Value of sales and number of placement are cumulative through 1975.  
Source: Trade interviews

NCR Corp. of the United States was the second supplier that year and had 65 installations or 22.4% of total placements. Other U.S. suppliers included Sperry Rand Corp., Honeywell Inc., Burroughs Corp., and Control Data Corp.

U.S. firms, led by IBM, clearly dominate computer sales in Iran. There are several reasons for this sales success: recognized high U.S. technology, early penetration of the Iranian market, excellent technical support, aggressive marketing, and the ability to provide a full range of products and services. Its capability of being programmed for output in the Farsi language has been a key selling point for IBM's System 3. IBM's policy of leasing main-frame computers has also contributed to repeat sales as users expand their systems or upgrade to next generation installations. New entrants to the computer market in Iran include Digital Equipment Corporation, (U.S.), Data General Corp., (U.S.), Wang Laboratories Inc. (U.S.), Raytheon Company (U.S.), and Interdata Limited (U.K. subsidiary of Perkin-Elmer Corp of the U.S.) none of which accounted for more than 1% by value of the installed computers in 1976. These firms supply primarily small and minicomputers, which are generally sold rather than leased.

**General Business Equipment.**—Approximately 40 foreign suppliers of general business equipment were regularly selling in Iran in the mid-1970's. Sharp

Inc. of Japan was the leading supplier of hand-held calculators with about 20% of total sales. Toshiba Company and Canon Company of Japan, Victor Comptometer Corp. of the United States, and Facit AB. of Sweden each held smaller shares of the market. Hewlett-Packard Co., which had been selling from its European headquarters in Switzerland, established an Iranian subsidiary company in 1976. Other suppliers include Monroe Company, Bowmar Instrument Corp. and Texas Instruments Inc. of the United States, Ricoh Company, Sanyo Company, and Casio Company all of Japan. Although U.S. suppliers initially dominated the calculator market, large inroads have been made by Far Eastern suppliers selling lower priced, simpler machines. American suppliers should maintain a leading position in sales of the higher priced, more complex machines.

In 1976 the leading supplier of typewriters was IBM Deutschland GmbH, the German subsidiary of International Business Machines (U.S.), with close to 20% of sales. IBM was followed by Olympia Werke AG and Triumph-Adler GmbH also of West Germany, and Olivetti S.p.A. of Italy. Sperry Rand Corp., a U.S. company supplying from its West German subsidiary, Sperry Rand GmbH; Facit AB. of Sweden; Litton Industries (Royal typewriters) and SCM Corp. both of the United States; all had a small share of the market. IBM's sales dominance is expected to continue by virtue of the recognized high quality of its products, excellent after sales service facilities and its early development of a Farsi language keyboard.

NCR Corp. of the United States made approximately 30% of the accounting machine sales and 40% of the cash register sales in 1976. Other cash register suppliers included Aster Co. of West Germany, Toshiba of Japan, and Sweda of Sweden.

In 1976 copying machines were supplied by Rank Xerox Limited of the United Kingdom which made about 30% of all sales, followed by IBM and Minnesota Mining and Manufacturing Co. (3M) of the United States, and Toshiba Company. Minolite Company, and UBIX Company of Japan. Gestetner Limited of the United Kingdom, Geha GmbH of West Germany, Apeco Corporation, and GAF Corp. of the United States all made limited sales of copying machines in 1976. In that year Siemens AG of West Germany and Telex Corp. of the United States divided the major share of telex machine sales between them; International Telephone and Telegraph Corp. also sold a small amount. Kardex Company of the United States (filing systems), Pitney-Bowes Limited of the United Kingdom (letter stampers), Eastman Kodak Company, 3M of the United States, and Canon of Japan (microfilm and microfilm equipment) were represented and selling in Iran.



## Marketing Factors

Sales of general business equipment are normally made through Iranian distributors. Most suppliers of computers and other high cost business machines sell through supplier-owned subsidiaries. Computer suppliers often use demonstration models to aid in their sales efforts, but generally do not stock computers in Iran. General business equipment is sold both in distributors' showrooms and by trained salesmen who call regularly on large customers. Smaller items, such as calculators and small office equipment are also sold in numerous department and stationery stores throughout the country.

Large computer systems are generally leased, while minicomputers are almost always purchased. Iranian users of computers and peripheral equipment have traditionally sought single-source suppliers for all hardware and software requirements. For purchases of general business equipment, delivery, reputation, and price are the most important considerations in Iran weighted by customers.

Sales promotion of general business equipment in Iran is generally limited to customer demonstrations for new product introductions and advertisements made in news media. Computer and high-cost business machines suppliers rely heavily on personal sales calls on large customers. A large part of promotional budgets are spent on sales brochures and catalogs.

### COMPETITIVE POSITION OF U.S. SUPPLIERS

Excluding computers, U.S. suppliers sold just over one-fourth of the very competitive Iranian business

equipment market in 1976. NCR, IBM, Telex, Eastman Kodak, 3M, and other large U.S. suppliers had established strong representation. Most of the major U.S. suppliers, about 20 in number, have sold in Iran for many years and are recognized leaders in their particular product categories. Several U.S. based multinational firms such as Hewlett-Packard, shipping out of Switzerland, and IBM which supplies many items from its plants in Europe, export considerable non-U.S. sourced equipment, but most U.S. firms ship directly from manufacturing plants in the United States.

U.S. firms were recognized leaders in marketing and after sales service in the mid-1970's, and have a good reputation for the quality and dependability of their equipment. Many Iranian computer users have expressed criticism, however, of what they consider as overly aggressive selling techniques by U.S. firms, particularly in computer sales. Such practices, which have sometimes left computer users with considerable over capacity, and without means to fully exploit equipment capabilities can only lead to a dampening of long-term sales. Computer suppliers can increase sales in Iran by placing greater emphasis on customer needs, software design and training of computer personnel.

The recognized American leadership in computer technology should help U.S. suppliers of other technologically advanced business equipment maintain relatively high sales for many years. In the Iranian market for general office equipment, however, U.S. suppliers have not been competitive in price and the U.S. suppliers' market share for this equipment is expected to decline somewhat during the 1976-85 period if current trends continue.

# Medical and Health Services

AS PART of Iran's program to provide comprehensive health care for all citizens by the mid-1980's, the Fifth Development Plan (1973/74-1977/78) envisions an expansion of virtually all medical facilities and services existing at the outset of the plan. Implementation of this program will require an enormous investment in facilities, equipment and training programs for medical staff. During the last 2 years of the Fifth Development Plan period \$1.98 billion was budgeted for health services.

Iran's program to provide nationwide health services is expected to result in excellent opportunities for sales of all types of medical equipment and services. Medical and surgical instruments, electro-medical equipment, and medical diagnostic system have the greatest growth potential for sales during this period. Iran is expected to import over \$240 million in medical equipment from January 1977 to December 1980. Equipment purchases should be nearly \$90 million. In the mid-1970's, American companies furnished Iran with about 25% by value of all its medical equipment requirements. More U.S. companies are expected to establish themselves in this rapidly expanding market.

## STRUCTURE AND SIZE

In January 1976, Iran had 504 hospitals and nearly 49,000 hospital beds<sup>1</sup> (see table 1). Almost 40% of all hospital beds are located in Tehran. The number of available beds doubled between 1970 and 1976; most hospitals were small (50-100 beds) and over 70% were for general care. Few specialized facilities existed, and in mid-1976, Iran had only two heart- and three cancer-treatment facilities. There were 124 private hospitals in operation that year. The remaining 380 facilities were run by government organizations. While 25% of all hospitals were privately owned, they tended to be smaller than government-owned hospitals and contained only 14% of all available hospital beds.

In 1975 Iran had 2,879 clinics throughout the country, of which 86% were operated by govern-

ment agencies. These clinics were split between rural and urban locations with 54% located in cities and 46% in rural sections of the country. Most clinics are small with less than 5% having as many as 15 full-time staff members. Fifteen percent of the 20,000 personnel employed in clinics were medical interns and the percentage of experienced physicians was even lower. Most clinics provided general treatment with only 9% giving specialized medical services such as radiology and eye treatment. In the mid-1970's, 616 clinical laboratories existed. Of this total 285 were attached directly to hospitals. The remaining 331 laboratories provided services to various hospitals and private physicians. Only slightly over 10% of all medical laboratories were privately operated, with the remainder either attached to hospitals and large clinics or operated directly by government medical institutions.

In 1976 health services in Iran employed 11,373 physicians. One-third of these were specialists, and the remainder were general practitioners. Physicians are required to work for government institutions in the morning, consequently in 1976 only 53% had a private practice. It is difficult to find physicians willing to work in rural areas. The Government has taken several steps to solve this problem. Physicians are required to spend 2 years in military service assigned to health care programs in rural areas. Since the medical needs in rural areas were still not being met, in the mid-1970's Iran began recruiting physicians from Korea, India, and Pakistan on 2-year service contracts. In 1976, 2,000 physicians from Asian countries were under service contracts.

Iran's seven medical schools provide general medical training, but most specialized training is acquired abroad. The medical college, of Tehran University and Melli University, both located in Tehran, have closely associated medical programs, but only Tehran Medical College at Tehran University provides a range of specialized training.

During 1975, 5,644 students were enrolled in the seven medical schools. These schools offered 24 specialties ranging from obstetrics and ear-nose-throat to heart and brain surgery. The five dental schools graduated 148 dentists in 1975-76 and had a total enrollment of 1,175 (see table 2).

<sup>1</sup> These figures include the 20 hospitals operated by the Imperial Armed Forces. Detailed information on the size and location of these hospitals is not available.



**Table 1.—Iran: Medical and Health Care Development**

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>2</sup>
<b>Number of Medical Facilities</b>						
Hospitals .....	480	2 474	486	504	509	565
Hospital Beds .....	35,795	42,300	44,600	48,900	49,800	63,000
Clinics .....	2,207	2,620	2,730	2,879	2,895	4,200
Clinical Laboratories .....	239	473	558	616	650	780
<b>Number of Personnel</b>						
Physicians .....	7,780	9,882	10,527	11,373	12,149	15,350
Dentists .....	1,170	1,227	1,374	1,462	1,582	2,120
Registered Nurses .....	5,329	6,794	7,195	7,759	8,323	10,800
Nurse's Aides .....	12,760	20,180	20,599	21,047	23,355	32,200
Midwives .....	1,710	1,940	2,290	2,791	3,565	7,065
Medical Technicians .....	419	530	712	926	1,380	3,280
Total Medical Personnel .....	29,168	40,553	42,697	45,358	50,354	70,815
<b>New Capital Investment</b> (millions of U.S. Dollars)						
Government .....	\$ 67.3	\$ 92.0	\$128.4	\$221.5	\$147.6	\$392.0
Private .....	3.8	6.0	10.6	13.4	15.3	27.0
Total Capital Investment .....	71.1	98.0	139.0	234.9	162.9	419.0

<sup>1</sup> Estimated.

<sup>2</sup> Twenty-two hospitals with under 20 beds were reclassified as medical centers, causing the drop in the total number of hospitals.

Source: Iranian Medical Association, Iran Statistical Center, Ministry of Health, Fourth Development Plan, Fifth Development Plan, Plan and Budget Organization Assessment, and estimates based on trade interviews.

In 1975 7,700 registered nurses, 1,462 dentists, 2,791 midwives, and over 21,000 nurse's aides were employed in medical services. Iran's 34 nurse's training schools graduated 564 registered nurses and 2,308 nurse's aides graduated from the training centers in 1975. The 36 midwifery institutions located nationwide trained 774 midwives in 1975.

The number of medical technicians in 1976 was estimated at just below 1,400. Many medical and

laboratory technicians were trained on the job. As of 1976 several programs existed for training medical technicians either operating or in the embryonic stage. The Ministry of Health through 1976 operated a school which graduated 300 laboratory technicians per year from a 2-year program. Imperial Organization for Social Service (IOSS) operated a small program (50 students per year) to train laboratory technicians and radiologists during 1974-76 and was considering inaugurating an expanded program in 1977. The Pahlavi University in Shiraz inaugurated a training program for radiologists and laboratory technicians in 1977 with 50 students. The Red Lion and Sun Society (RLSS) established a medical technicians training center in 1974. The center graduates over 100 technicians yearly with courses in radiology, laboratory services, equipment maintenance, surgical room procedures, and anesthesia. They must work a mandatory 4 years for RLSS upon graduation. The Ministry of Health in 1977 was undertaking a comprehensive study of requirements for radiology, laboratory, and other medical technicians, with the objective of developing expanded training programs to meet Iran's growing needs of such personnel.

The Tehran University College of Health, founded in 1966, is run in association with the World Health Organization. It offers separate specialized programs leading to certification in Public Health as well as postdoctoral programs in public health. In 1975, 230 students were enrolled in the college. The College of Pharmacy of Tehran University was formed as a separate faculty in 1946. It graduated 252 pharmacists from its 6-year program in 1975. Tehran University's College of Veterinary Medicine, founded in 1930, graduated 152 veterinarians from its 6-year program in 1975.

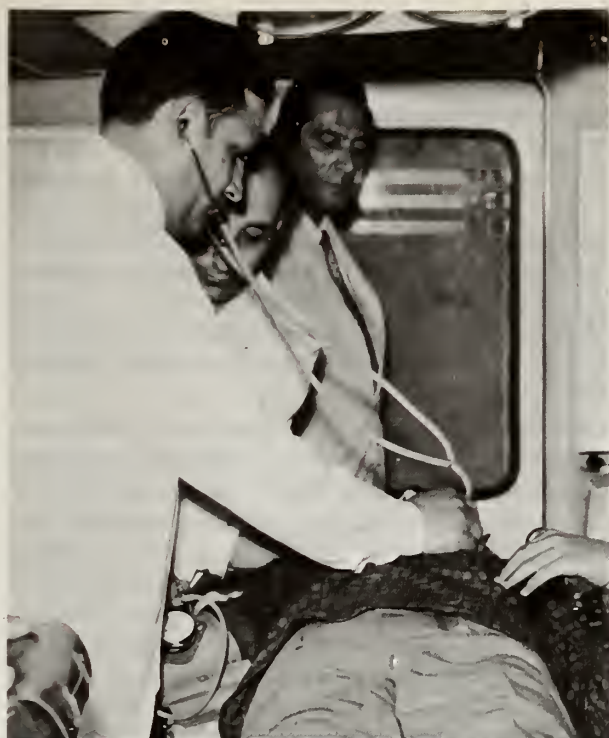
**Table 2.—Iran: Enrollment and Graduates of Medical and Dental Colleges during the 1975-76 Academic Year**

	Location	Total Enrollment	Graduates
<b>Medical Schools</b>			
Tehran Medical College ....	Tehran	1,708	205
Azarbadegan Medical College .....	Tabriz	782	102
Esfahan Medical College ...	Esfahan	706	63
Ferdowsi University College of Medicine .....	Mashhad	645	83
Pahlavi University College of Medicine .....	Shiraz	646	46
Jondi Shapur University College of Medicine .....	Ahvaz	487	61
Melli University College of Medicine .....	Tehran	670	104
Total Physicians in training		5,644	664
<b>Dental Schools</b>			
Tehran College of Dentistry .	Tehran	445	80
Esfahan College of Dentistry <sup>1</sup> .....	Esfahan	18	—
Ferdowsi University College of Dentistry .....	Mashhad	218	26
Pahlavi University College <sup>2</sup> of Dentistry .....	Shiraz	126	—
Melli University College of Dentistry .....	Tehran	368	42
Total Dentists in training ....		1,175	148

<sup>1</sup> First year of operation.

<sup>2</sup> Will begin graduating dentists during the 1976-77 academic year.

Source: Medical Disciplinary Board Statistics.



*Mobile medical units are used to bring health care to remote areas.*

The Government increased its appropriations for fixed investment in medical equipment and facilities from \$67 million in 1970 to \$221 million in 1975. Although new investment in 1976 was reduced from 1975 levels, expenditures should continue to grow as more hospitals are added to the health care system.

Private investment in medical service has been relatively small, but it is expected to grow. It totaled \$3.8 million in 1970 and is estimated at \$15 million for equipment and facilities in 1976. This large increase is due, in part, to a government program which provided low interest loans to private investors for the building of new hospital facilities. Although the Government later canceled the program, private investment is expected to grow at an annual rate of approximately 20% through 1980, reaching \$27 million.

## Major Medical Organizations

**The Ministry of Health and Welfare.**—The Ministry of Health and the Ministry of Social Welfare were merged in 1976; however, each retained its headquarters and functions. Eventually the new Ministry will be decentralized into semiautonomous provincial units. The health section of the Ministry is generally responsible for planning, coordination of private health care, importation of pharmaceuti-

cals, and standards for and supply of medical personnel. The welfare section, dominant in the reorganization, administers the Social Insurance Plan and new hospital projects. The Iran Housing Corporation, the Ministry's wholly owned subsidiary, is charged with implementing the architectural and construction phases of new hospitals, while the welfare section of the Ministry procures nonfixed equipment, recruits staff, and manages the new hospitals.

The Government health care budget in 1976/77 totaled \$886 million, over half of which was administered by the Ministry of Health and Welfare. In that year the Social Insurance Organization under the welfare section of the Ministry operated 32 general hospitals, with a total of over 9,100 beds. The Ministry also operated 29 specialized hospitals (including mental, psychiatric, leprosy, drug addiction and rehabilitation), 1,101 clinics, 109 medical laboratories, and employed almost 60,000 people (see table 3). Most employees are administrative, but about 25% are medical. In addition, many of the hospitals built in the past under the jurisdiction of the Ministry of Health are operated by the Red Lion and Sun Society, a separate government agency, and various universities. The Ministry supervises the medical facilities of a number of other government agencies, including the Imperial Organization for Social Services, the Ministry of Roads and the National Iranian Oil Company, and operates various specialized health care institutions such as the Pasteur Institute, the Foodstuffs and Nutrition Institute, the Hospital Science Institute, the Iran Rehabilitation Society, and the Malaria and Contagious Diseases Campaign Organization.

The Social Insurance Fund has been expanding throughout the 1970's to provide medical and retirement insurance coverage to workers and salaried employees. The program is funded by a payroll de-

*Table 3.—Iran: Medical Facilities by Operating Organizations, 1976*

Organization	Hospitals	Hospital Beds	Clinics	Laboratories
Ministry of Health .....	29	3,540	1,101	109
Health Corps .....	—	—	480	138
Red Lion and Sun Society .....	204	12,500	272	—
Imperial Organization for Social Services .....	10	883	272	—
National Iranian Oil Company ..	8	952	61	—
Ministry of Roads .....	14	1,104	56	—
Social Insurance Organization ..	32	9,117	175	17
Ministry of Education .....	—	—	55	—
Universities .....	37	8,185	30	32
Private .....	126	6,794	181	267
Police/Military .....	20	1,682	15	—
Charity .....	2	450	45	16
Mothers' and Children's Protection Agency .....	10	792	8	—
Others .....	11	2,900	128	35
Total .....	503	48,899	2,879	614

Source: The Ministry of Health.



duction (7% of salary) and an employer contribution (14% of salary) up to \$192 a month. In the future the fund will provide the capital for most new hospital development projects.

**The Red Lion and Sun Society.**—This government agency was originally formed on the model of the American Red Cross. The primary objective of the Red Lion and Sun Society (RLSS) when founded was to provide emergency medical aid in time of national disasters. By the mid-1970's, RLSS had been greatly expanded, and it now administers and staffs most of the hospitals formerly run by the Ministry of Health. In 1976, 204 hospitals with a capacity of 12,500 beds, and 272 clinics were under its jurisdiction. In addition to disaster relief work within Iran, RLSS organizes and runs a system of temporary medical treatment facilities during the annual Hadj pilgrimage to Mecca, Saudi Arabia. From its 1976 budget of \$160 million, \$98 million was allocated for the building of new hospitals. In 1976, the RLSS staff numbered 18,000, operating 4 nurses' training schools, 23 nurse's aides schools and 3 midwifery schools and employed 820 physicians of which 320 were foreign physicians serving under 2-year service contracts.

**Imperial Organization for Social Services.**—Formed in 1947 with the object of improving medical, social, and cultural opportunities for the Iranian poor, in 1976 the Imperial Organization for Social Services (IOSS) operated 10 hospitals located mainly in provincial capitals, and 272 clinics in low-income rural and urban areas. It also operated 140 nutritional counseling centers and 255 family planning centers nationwide. IOSS has established the first school for training paramedical personnel. It treated 4.5 million patients and performed over a half million surgical operations from 1947 to 1976. The 1976 IOSS budget was \$35 million; that year it employed a total staff of 6,000 and had an additional 4,000 personnel under contract. IOSS also had a \$11-million project budget for building new facilities in 1976.

**University Medical Facilities.**—There are 37 hospitals affiliated with universities throughout Iran. These hospitals provide medical training for students at the university medical colleges. The largest complex of university hospitals is operated by the Medical Group of Tehran University and the Melli University. The Medical Group operates 16 hospitals in Tehran, including general hospitals totaling 2,339 beds, 2 maternity hospitals totaling 457 beds, 2 pediatric hospitals totaling 202 beds, 1 cancer treatment hospital with 150 beds and 1 heart treatment hospital with 21 beds. In addition, the complex includes 13 general clinics, 13 laboratories and 52 specialized clinics (specialized clinics are not in-

cluded in the totals in table 3). In 1975, 1,094 physicians and 135 dentists were employed by the Medical Group. The remaining 5 medical schools have smaller hospital systems, and combined they operate 10 general hospitals with 1,441 beds, 10 maternity hospitals with 1,870 beds, 1 pulmonary treatment hospital with 100 beds, 18 general clinics, 19 laboratories, and 65 specialized clinics. The hospitals and clinics attached to these five schools employed 737 physicians and 60 dentists in 1975. In 1976 there were only limited medical research facilities at the university level, and no private medical research facilities in Iran.

**The Health Corps.**—In an attempt to provide better health and medical services to Iran's more remote populations, the Health Corps was formed in 1964. The Health Corps is staffed with physicians and other trained medical personnel, as well as college and some high school graduates chosen to work as health teams throughout the rural areas. The first group of 423 health corpsmen was assigned in January 1965 following a 6-month military and special training course. In 1976 there were 372 active health corps teams totaling 499 members operating 480 clinics and 138 laboratories.

**Private Hospitals.**—Iran's 126 private hospitals had a total of 6,794 beds in 1976. These hospitals tend to be smaller than government hospitals, but for the most part, they furnish better medical treatment. In addition, 181 clinics and 267 medical laboratories were operated by private groups in the country.

**Other Agencies.**—Several government ministries operate their own medical facilities. The Ministry of Roads, for example, has 14 hospitals which provide care for its employees and their families. The Ministry of Education operates 55 clinics. The Mothers' and Children's Protection Agency operates 10 pediatric hospitals, and is the main agency providing health care for Iran's orphans. Other organizations such as the National Iranian Oil Company, foreign diplomatic missions, and charity organizations account for the remaining 10% of the medical facilities in the country. In addition, the Imperial Armed Forces operate 20 hospitals.

## Representative Hospitals

The Queen Pahlavi Heart Hospital is one of two specialized heart treatment hospitals in Iran. Run by the Pahlavi Foundation, a government charitable agency, it also treats other medical problems. In 1976 it employed a staff of 684. Of these, 38 were physicians specializing in heart disease, and 77 were general practitioners. Plans call for the expansion of the hospital from its 290 beds in 1976 to 490 beds

in 1980. In 1975 the hospital's budget was \$8.3 million of which \$1 million was budgeted for purchases of medical and laboratory equipment, both new and replacement. The budget for 1976 was \$9.7 million. The hospital contains central stations, intensive care units (ICU), radiology, cardiology, and internist departments. Some equipment in use in 1976 was Philips (Netherlands) physio-control apparatus; General Electric (U.S.) defibrillators, bedside and central stations, and intensive care systems obtained from Philips and Space Labs Inc. (U.S.). Queen Pahlavi Heart Hospital normally imports equipment directly from manufacturers since it is exempted from payment of customs duties. All major equipment purchases must be approved by a committee consisting of three physicians and the director of the hospital's purchasing department.

The American Hospital in Tehran is owned by a group of private physicians and was established in 1974. Its staff includes 10 specialized physicians and 110 nurses for the following departments: central station/maternity, postpartum, orthopedic laboratory, X-ray and physiotherapy. Plans for the hospital include an expansion from 83 beds in 1976 to approximately 115 beds, and the addition of pediatric and surgical departments. Charter Medical Corporation (U.S.) in 1975 was awarded a management contract to equip and operate all the hospital's departments. In 1976, the management contract for the hospital was canceled and the hospital is now run under local management. The American Hospital is equipped mainly with U.S. equipment, such as intensive care systems and electrocardiographs supplied by Hewlett-Packard Co., respirators from Puritan-Bennett Corp. and intensive care monitors and resuscitation systems from Airco Inc. The operating room equipment has been supplied mainly by Ritter AG (West Germany) and Medicorp (Hungary). The American Hospital of Tehran is one of the most modern and fully equipped hospitals in Iran.

## TRENDS, PROGRAMS, AND PROJECTS

Iranian health care facilities are becoming more modern in terms of both the equipment used and the type of treatment given. The development results directly from the Government's program to provide full health care services to all citizens. The government program, called the Master Health Care Plan, was drawn up by the Ministry of Health and Welfare and is designed to provide hospital facilities nationwide. This will be accomplished by the establishment of 14 regional hospitals with an average 600 beds each, providing both general and specialized treatment and complete laboratory services. Each

regional hospital is to provide supervision and referral services to a number of smaller hospitals and clinics within its region. Three regional hospitals have been under construction for some time, and design is underway on 11 more. Estimated cost for all 14 hospitals is about \$500 million.

Smaller cities with 40,000 to 100,000 population within a region will be provided with 50-150 bed hospitals consisting of four main wards (internal, surgical, women's, and children's). The Master Health Care Plan calls for 130 of these smaller hospitals; by late 1976 funds for 25 had been committed and construction had begun (see table 4). In towns of under 40,000, a health center, basically a clinic with four to six medical personnel, will be established. These health care centers will refer serious medical cases to the small hospitals or the regional hospital. The smallest medical units included in the plan are hygiene centers which will service rural populations of 1,400 to 15,000. Hygiene centers will be staffed by two medical practitioners and will be under the supervision of the health centers. The Master Health Care Plan is to be administered by the Ministry of Health and Welfare. Total man-

**Table 4.—Iran: Representative Government Medical and Health Care Projects**

Location	No. of Beds	Year Started	Completion Year	Estimated Cost
				(Millions of U.S.\$)
Red Lion and Sun Society Projects				
Mahabad .....	100	1974	1977	7.0
Kerman .....	500	1974	1977	35.0
Shiraz .....	500	1975	1978	35.0
Tabriz .....	250	1977	1982	18.7
Rezaieh .....	250	1977	1981	18.7
Karaj .....	200	1977	1981	7.0
Babolsar .....	100	1977	1981	7.0
Ministry of Health & Social Welfare				
Tehran (Darrous) .	500	1968	1977	35.0
Kermanshah .....	150	1974	1978	10.5
Kashan .....	150	1975	1979	28.0
Small cities				
(12 facilities) .	900	1974	1978	63.0
Small cities				
(13 facilities) .	975	1975	1979	68.2
Imperial Order of Social Services				
Shoshtar				
(expansion) ...	50	1975	1977	3.5
Qom .....	300	1975	1978	21.0
Ramsar .....	150	1975	1977	10.5
Mothers' and Children's Protection Obstetrical Hospitals				
Behbahan .....	50	1977	1979	3.7
Shiraz .....	50	1977	1979	3.8
Tehran .....	50	1979	1981	4.0
Tehran .....	1,000	1976	1980	75.0
Pahlavi Foundation				
Tehran				
(expansion) ...	200	1977	1980	14.0
5,625		—	—	476.5

Source: Ministry of Health, and estimates based on trade interviews.



power requirements for staffing the planned facilities are 30,000 persons.

Plans for the Queen Pahlavi Heart Hospital call for an expansion of 200 beds. The expansion will be started in 1977 at a cost of about \$14 million. Other large medical projects are the Ministry of Health and Welfare's 400-bed Rehabilitation Center in Tehran for which a construction tender has been issued; the 500-bed Reza Charity Hospital in Mashhad which is in preliminary design and which will be funded by a group of Mashhad organizations; the 700-bed hospital attached to Esfahan University Medical School which was in preliminary design in 1976; two new hospitals being built by the Imperial Order of Social Services; and one hospital expansion being undertaken by the same organization. Total cost of the last three projects is estimated at over \$35 million. The Mothers' and Children's Protection Agency is also planning construction of several obstetrical hospitals. One of these, which was started in 1976, is a 1,000-bed hospital which will be among the largest in Tehran. This agency has budgeted over \$22.4 million for the hospitals which are expected to cost a total of over \$86 million and to be completed by 1980. The university medical program is under the supervision of the Ministry of Science and Higher Education, which is also the agency responsible for the new Imperial Medical Center of Iran (IMCI) which eventually will include a nursing school, a 600-bed hospital and referral clinics. IMCI is presently in the design stage.

## GROWTH PROSPECTS

Considering the government appropriations of \$3.7 billion (see figure 1) for all health related activities during the period of the revised Fifth Plan, and the high priority placed on expanding health care nationwide, rapid growth is expected in Iranian medical services in the late 1970's. Allocations for health-related expenditures during the final 2 years of the Fifth Plan are approximately \$1.9 billion.

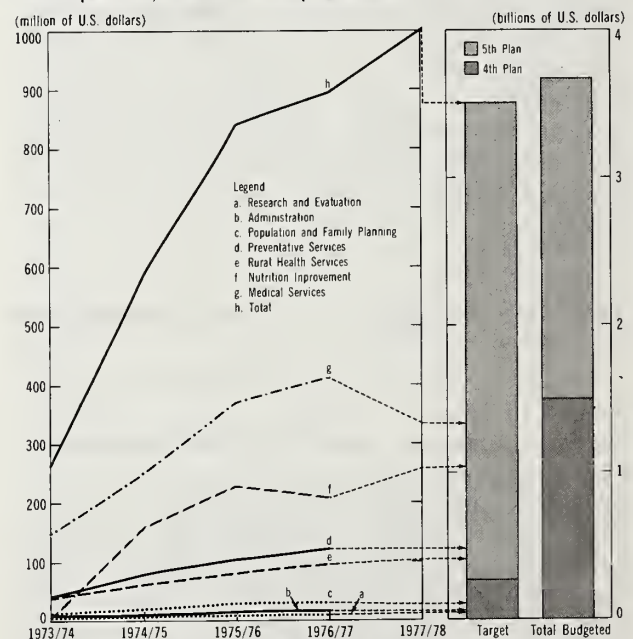
During the period of the Fourth Development Plan (1967/68–1972/73), Iran allocated \$1.5 billion for health and medical activities, or only 34% of the amount allocated in the Fifth Plan. A major goal of the Fourth Plan was the improvement of the hospital bed population ratio from 11.8 beds per 10,000 population in 1968 to 15 beds per 10,000 population in 1973. To accomplish this the Plan called for an increase of 14,500 beds by 1973. According to the Plan and Budget Organization of Iran, the actual number of beds added during the Fourth Plan period was 11,000 and the hospital bed population ratio at the end of the plan in 1973 was 13.6 beds per 10,000 population. During 1968–

73, almost 3,000 physicians were graduated from medical schools. However, due to attrition within the medical profession from retirement and emigration, the increase of physicians actually practicing was only 2,082.

While not accomplishing all plan goals, Iran made significant improvements in health and medical services during the years of the Fourth Development Plan. However, the high rate of development in health and medical services called for in the revised Fifth Plan has brought to the attention of official planners a number of shortages and bottlenecks that were not experienced during the period of the Fourth Plan.

One of the greatest factors limiting growth in medical and health care services in the mid-1970's is the overall shortage of physicians and other trained medical personnel, as well as their poor geographical distribution. Over 60% of all physicians and dentists are clustered in Tehran. The main goal of the Health Corps program was to overcome this geographic imbalance. Other measures to help solve the shortage of medical personnel are the programs of the Red Lion and Sun Society and the Imperial Organization for Social Services to recruit physicians from abroad. In 1975 most physicians brought into the country were assigned in provincial areas. The shortage of medical personnel will, however, not be solved by foreign recruitment and geo-

Figure 1  
Iran: Medical and Health Care, Comparison of Targeted and Budgeted Public Sector Expenditures, 4th and 5th Development Plans



graphic redistribution alone. One noted Iranian medical authority stated that with recruitment at 1975 levels, even if the emigration of Iranian physicians ceased and all those abroad were to return, the shortage in rural areas would still remain.

The number of medical personnel graduating from Iran's various medical training facilities has been rising. In 1970, 507 physicians were graduated, as compared with nearly 800 in 1975. Also in 1975, 560 registered nurses and 2,300 nurse's aides completed training and began work. Attrition figures are not available, but even assuming no attrition, the number of medical personnel completing their training will not be enough for Iran's needs. The Fifth Development Plan projects requirements for 8,500 additional physicians and 35,600 additional other medical personnel by the end of 1978, while anticipating a shortfall of 1,300 of the former and 21,200 of the latter.

In 1975, there were 5,372 students enrolled in Iran's medical colleges, 773 of whom began their studies that year. The medical school curriculum is 6 years in duration; therefore, even if medical training facilities are expanded, the number of new Iranian physicians entering their professional careers between 1976 and 1980 cannot exceed 4,599. It is estimated that the number of foreign-trained Iranian physicians returning to Iran during 1976-80 will be offset by the number of Iranian physicians who will go abroad for specialized study, many of whom will remain abroad. It is also estimated that in 1976 about 15,000 Iranian physicians were living abroad, less than half of whom were studying in specialized fields. Undoubtedly, foreign physicians will have to be recruited in increasing numbers well past 1980, when the total number of Iranian physicians is expected to be slightly over 15,000.

Progress in the construction of medical facilities was hampered during 1975 and 1976 by a shortage of allocated funds, and there were fewer hospital starts than anticipated. Most development projects during 1974 and early 1975 were paid for on a cash basis. In late 1975, government agencies began seeking supplier credits, and some projects were delayed or eliminated. In addition, because of massive Iranian port problems and shipping delays, building materials have been in short supply throughout the construction industry. Shipments of medical equipment were also hampered by transportation bottlenecks. Congestion in airport customs areas frequently resulted in delay, damage, or loss of expensive equipment.

Because of these problems many medical development projects planned for completion during the Fifth Plan will be delayed, particularly the construction of hospitals and health clinics. Of the 20,000 hospital beds scheduled to be added during the Fifth

Plan period, only 5,200 had been added by mid-1976. It is estimated that between 1977 and 1980 about 6,000 additional hospital beds will be made available, but there will be critical shortages of medical personnel to staff completed medical facilities. It is projected that the number of hospital beds will grow from 49,600 in 1976 to 63,000 in 1980, or a ratio of 16.5 beds per 10,000 population.

## CAPITAL GOODS MARKET

The total market for medical equipment in Iran amounted to over \$44 million in 1975, more than double 1973 sales (see table 5). Based on the Government's Master Health Plan and new hospital facilities planned by private groups, total sales in 1980 should reach nearly \$90 million, representing a 15% average annual growth rate. During 1975-80, sales of nearly all types of equipment should grow rapidly. Since there is no Iranian manufacturing of medical equipment, all requirements are imported from foreign suppliers.

### Imports

Imports of all categories of medical equipment rose sharply during 1973-75. During this period the value of medical instrument imports more than quadrupled, and X-ray equipment imports tripled. These two categories accounted for almost 70% of Iran's imports of medical equipment during 1975.

In 1975, West German suppliers provided 27% by value of Iran's medical equipment imports, followed by American suppliers who had 23%. While West German suppliers have dominated Iran's medical equipment market for many years, American suppliers began making large sales in 1974.

Iran's imports of electro-medical equipment rose from \$1.5 million in 1973 to \$3.2 million in 1975. U.S. suppliers held 46% of this market in 1975, followed by West German suppliers who held 27%. U.S. and West German manufacturers are expected to supply over half of all Iran's imports of electro-medical equipment at least through 1980. U.S. suppliers are especially strong in the sales of sophisticated monitoring systems while West German suppliers mainly furnish items of a more general purpose nature.

U.S. and West German suppliers divided 66% of Iran's market for X-ray equipment in 1975. X-ray equipment sales have been growing steadily from \$3.2 million in 1973 to over \$8 million in 1975.

Iranian sales of medical instruments more than tripled from 1973 to 1975, amounting to nearly \$23 million in 1975. Medical instruments were among the first items purchased in Iran when government oil revenues and spending increased in 1973. West



**Table 5.—Iran: Size Of The Market For Medical Equipment**  
(Thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>ELECTRO-MEDICAL EQUIPMENT</b>					
Imports					
United States .....	449	819	1,455	1,620	3,900
West Germany .....	491	665	787	—	—
United Kingdom .....	148	205	320	—	—
Japan .....	105	135	132	—	—
Others .....	269	301	483	—	—
Total Market .....	1,462	2,125	3,177	3,650	11,700
<b>X-RAY APPARATUS</b>					
Imports					
United States .....	1,159	2,602	2,823	3,260	4,700
West Germany .....	1,320	1,376	2,519	—	—
Japan .....	329	656	959	—	—
United Kingdom .....	93	131	348	—	—
Others .....	258	308	1,369	—	—
Total Market .....	3,159	5,073	8,018	9,250	12,700
<b>MEDICAL INSTRUMENTS</b>					
Imports					
United States .....	985	2,686	3,765	4,960	7,800
West Germany .....	2,718	5,098	5,483	—	—
United Kingdom .....	1,696	1,980	3,777	—	—
Japan .....	584	1,813	4,387	—	—
Others .....	1,063	2,151	5,438	—	—
Total Market .....	7,046	13,728	22,850	23,500	41,100
<b>MEDICAL FURNITURE</b>					
Imports					
United States .....	95	230	552	450	800
West Germany .....	500	688	1,145	—	—
United Kingdom .....	205	128	167	—	—
Italy .....	45	238	246	—	—
Others .....	59	111	288	—	—
Total Market .....	904	1,395	2,398	2,020	3,800
<b>OTHER MEDICAL EQUIPMENT</b>					
Imports					
United States .....	676	1,141	1,710	1,900	4,700
West Germany .....	1,087	1,302	1,965	—	—
United Kingdom .....	133	262	480	—	—
Japan .....	554	487	730	—	—
Others .....	2,846	3,160	3,120	—	—
Total Market .....	5,296	6,352	8,005	9,900	20,500
<b>TOTAL MARKET FOR MEDICAL EQUIPMENT</b>					
Imports					
United States .....	3,364	7,478	10,305	12,190	21,900
West Germany .....	6,116	9,129	11,899	—	—
United Kingdom .....	2,275	2,706	5,092	—	—
Japan .....	1,597	3,091	6,308	—	—
Others .....	4,515	6,164	10,844	—	—
Total Market .....	17,867	28,568	44,448	48,320	89,800

<sup>1</sup> Estimated.

Source: United Nations, Organization for Economic Cooperation and Development, supplier country, and official Iranian trade statistics; estimates based on trade interviews.

German manufacturers supplied 24% of Iran's medical instruments in 1975, and U.S. manufacturers supplied 16%. Both U.S. and U.K. suppliers are expected to sell slightly more than West German suppliers by 1980.

By 1975, U.S. firms supplied almost one-fourth of all medical equipment imported by Iran. It is estimated that this market share will remain at its high level at least through 1980.

Japanese suppliers greatly increased their medical

equipment sales to Iran during 1973–75, and their market share reached 14%, valued at over \$6 million, in 1975. Japanese manufacturers supplied almost 20% of Iran's purchases of medical and surgical instruments in 1975. Japanese equipment is very competitive in price and has gained a significant portion of the Iranian market for that reason. Most Japanese firms selling in Iran have developed a successful sales strategy consisting of fast delivery, flexible pricing and liberal financing terms.

From 1973 to 1975, the market position of U.K. suppliers fell from third to fourth place. U.K. suppliers are expected to regain some of these sales during the late 1970's as a result of devaluation of the British pound in 1976, and the resultant lower prices of British medical equipment in Iran.

## Domestic Manufacture

There is no Iranian manufacture of medical equipment. Iranian companies produce only medical supplies such as tissues, sterilized cotton, and linen products. The Ministry of Health and Welfare, however, plans to enter into joint venture arrangements with foreign firms for production of disposable syringes and other health care products.

## MARKET OPPORTUNITIES

Sales of all types of medical equipment, from standard medical products to more advanced instruments, are growing rapidly. Sales will grow considerably by 1980. Due to the planned expansion of hospitals in the rural areas of the country, the largest sales will continue to be of general hospital equipment. Specific equipment requirements will include the following:

**Cardiological Equipment.**—The planned growth of large hospitals during 1977–80 will require purchases of defibrillators, both portable and stationary, and cardiac output analyzers, which will be needed in medical centers due to shortages of specialized physicians. Large purchases of electrocardiograph equipment should be needed in the small city hospitals established under the Ministry of Health's Master Plan.

**General Hospital Equipment.**—Due to the large development projects for medical facilities and the shortages of medical personnel, labor saving equipment will be required. Such equipment will include central station patient monitoring systems, bedside emergency/patient monitoring systems, as well as general equipment such as X-ray, apparatus and oxygen flowmeters. During the late 1970's opportunities should exist for sales of disposable equipment including basic items such as syringes and pre-

pared trays for various surgical procedures, and test and laboratory sets. The Ministry of Health in 1976 was seeking an investor to establish a disposable medical equipment manufacturing facility.

**Operating Room Equipment.**—Over 70 new operating rooms are expected to be built during 1976–80. General operating room equipment such as anesthesia equipment and surgical tables will be in greatest demand. Sales also will increase for specialized operating room equipment such as cryosurgical instruments, automatic sphygmomanometers and electrosurgical instruments.

**Pediatric Equipment.**—Iran's 1976 population of 34 million, with 7% under 2 years of age and over 1.2 million births each year, will require all types of pediatric equipment during 1975–80. Infant care incubators, intensive-care monitors, cystic fibrosis analyzers, resuscitation equipment and oxygen systems will be sold in large quantities during the next several years.

**Clinical Laboratory Equipment.**—Sales of clinical laboratory equipment will depend on the availability of clinical technical/medical staff. Laboratories are planned to be built in conjunction with new hospitals, and they should produce strong sales of clinical instruments such as gas chromatographs, infusion pumps, and blood/gas analyzers. Centrifuges for blood separation, microscopes, and other laboratory equipment also should be sold in large numbers.

**Other Medical Equipment.**—With Iran's medical facilities installing the most advanced medical equipment, a companion need exists for modern ambulance equipment. Iran's 560 ambulances, most of which are located in Tehran, are poorly equipped, and there is a shortage of paramedical personnel to administer emergency first aid. During 1976–80, there will be large sales of equipment used in ambulances such as portable oxygen systems, diagnostic equipment for vital signs, and emergency supplies of all types.

**Hospital Management Services.**—During 1974 and 1975, the Ministry of Health and other government agencies discussed the need for hospital management assistance contracts. By late 1975, only a few such contracts had been awarded. One U.S. company which has signed a management contract in Iran is Charter Medical Company, although this particular contract related to a private hospital and has been canceled. Iranian health officials indicate that the need for service contracts is only temporary, however. While some private hospitals are expected to continue to seek management service, government institutions will eventually develop their own management systems.

**Technical Services/Medical Equipment Maintenance.**—Most well-established suppliers of advanced medical instruments install and maintain their equipment, but some recent purchases have been made without a maintenance agreement. In 1976 several recently established firms were under contract to service and maintain hospital equipment for government medical facilities. This trend seems likely to continue, and good opportunities will exist for the establishment of additional private medical equipment service companies. Since there is a shortage of qualified technical personnel, foreign technical personnel often are employed by these service companies.

**Training Systems.**—Sales of medical training systems and materials are very limited. All Iranian medical schools are currently affiliated with universities. Medical and technical staff training programs are determined by guidelines developed by the Ministry of Education.

## MARKET ENVIRONMENT

### Buyers' Universe

Three main groups of medical equipment purchasers exist in Iran. The first and largest group consists of government agencies. Government agencies normally buy through their own purchasing departments, often by contract awarded after open bidding procedures. Within the Government, there are six large users; the Ministry of Health and Welfare, the Red Lion and Sun Society, military hospitals, the Ministry of Roads, the Imperial Organization for Social Services, and university hospital systems.

In addition, between 40 and 50 government-owned hospitals purchase equipment just for their own facilities. The remainder of the buying units are smaller, have limited hospital and clinical requirements and normally purchase equipment in the local market. In making sales to Iranian government agencies, medical equipment representatives maintain close contact with the technical staff of the several agencies having medical facilities.

The Ministry of Health and Welfare has assigned the bulk of its procurement of pharmaceuticals and expendable supplies to a subsidiary company, Sherkate Daroui Keshvar located on Bozorgmehr Street at Fariman Crossing, Tehran. The Ministry places orders with this company for all its requirements. Depending on inventory, the company supplies directly from stocks, replaced on a regular basis by local representatives of manufacturers. If ordered items are not in stock, Sherkate Daroui Keshvar either purchases from a local representative or issues a tender to obtain the order by contract. Equipment



purchased by the Ministry of Health and Welfare is exempt from all customs duties. Sherkate Daroui Keshvar also provides procurement services for several other government ministries, corporations, and organizations that operate medical care facilities. In 1976, Sherkate Daroui Keshvar had budgeted \$51 million to purchase medicines and supplies, which it planned to sell for \$55.8 million to its several client organizations. While Sherkate Daroui Keshvar reduced its purchases in 1975, the 1976 purchases of \$51 million represent a 28% increase over the previous year. All equipment for new hospitals will be purchased by tender by the Executive Department, Fifth Floor, Social Welfare Building, Fakhrrazi Street (off Shah Reza), Tehran. Present plans call for single source procurement on a total package basis for each of the Ministry's new hospitals. Only prequalified suppliers will be invited to bid on tenders, and local maintenance of equipment will be required.

The Imperial Organization of Social Services (IOSS) receives funds for building its new hospitals from the Government's Plan and Budget Organization. All expenses for staffing, equipping and operating medical facilities are paid directly by IOSS from its own operating funds. Hospitals and clinics affiliated with IOSS order equipment and supplies from the IOSS Central Supply Department. This department purchases about 8-10% of all medical equipment sold in the country. If the Central Supply Department does not have the required items in stock, the hospital or clinic may purchase directly from sales representatives. The IOSS Central Purchasing Department orders for its stock directly from foreign manufacturers. Its address is: Ghavem Saltaneh Street and Shah Avenue, Tehran.

Hospitals attached to universities in Iran normally order all requirements through Iranian sales representatives of foreign manufacturers. Since these hospitals are funded by the university to which they are attached, the purchasing department of the university is the principal medical equipment buying unit. Within budgetary limitations, however, university hospital administrators have a great deal of discretion in ordering the hospitals' professional equipment needs. University medical schools and their hospitals are exempt from customs duties. About 5-7% of all medical equipment purchases are made by university medical institutions.

The Social Insurance Organization buys all equipment requirements for its medical institutions through its own purchasing department, and accounts for about 4-5% of all equipment purchased in the country. The hospitals operated by the Social Insurance Organization place orders for equipment needs with the organization's purchasing department which either accepts or denies them. The administra-

tors of Social Insurance Organization hospitals have relatively little discretion in the types of equipment to be purchased.

Military organizations purchase medical equipment through their central procurement agencies.

A second group of medical equipment purchasers are the private hospitals. Private hospitals usually have a purchasing department, but the final purchase decision usually is arrived at by agreement among the hospital's professional staff.

Private medical clinics and hospitals purchase most of their equipment requirements through Iranian sales representatives and manufacturers' sales offices established in Iran. Private medical institutions pay customs duties on imported medical equipment ranging from 5 to 25% ad valorem. Most private medical institutions are not licensed to import and usually must order foreign equipment through a firm authorized by the Government to import.

Private physicians and small private clinics constitute the third group of medical equipment purchasers. This group generally buys from Iranian sales representatives and accounted for around 20% of all medical equipment purchases in 1976. Some private physicians and small clinics occasionally purchase equipment needs directly from a foreign manufacturer, but the volume of such purchases is very low.

Iranian medical organization administrators and professionals generally are well informed on modern medical practices and developments. Iranian medical organizations employ consulting companies only rarely, and then normally to provide assistance in recruiting foreign medical personnel to work in Iran under temporary service contracts. Some government agencies operating medical facilities have obtained temporary consulting services for assistance in planning equipment needs of new medical facilities.

## **Foreign Suppliers' Universe**

The large new medical programs in Iran have attracted most major foreign suppliers of medical equipment to make intensive sales efforts in the country during recent years. In addition to the several major foreign medical equipment manufacturers there are some 60 to 70 smaller foreign suppliers exporting to Iran on a regular basis and representing over 60% of all equipment sales. Most foreign suppliers sell directly from manufacturing plants in Europe, the United States, and Japan to Iran through their authorized representatives. Only a few multinational companies supply Iran from other than their home country manufacturing plants. Hewlett-Packard Company, for example, sells to

Iran through its European headquarters located in Geneva, Switzerland, and equipment is sourced from several manufacturing plants in the United States and other countries.

West German suppliers make strong marketing efforts in Iran and have a good reputation among Iranian medical officials for the quality of their equipment and attention to after sales maintenance. The West German firm Siemens AG shares the majority of Iran's X-ray equipment sales with General Electric Company (U.S.). Siemens has been represented in Iran for decades and enjoys excellent reputation for the quality of its products and after sales service. Siemens also leads in sales of emergency power equipment to Iranian hospitals, and its operating room equipment is considered the most advanced in the country. Suppliers from the United States are relative newcomers in Iran, but have developed a good reputation among Iranian medical professionals. Among Iranian users, U.S. equipment is considered to be of equal quality to, and more advanced technically than, that supplied by any other country. American suppliers are especially strong in sales of clinical laboratory equipment, electro-medical equipment and nearly all types of advanced instruments requiring a high degree of accuracy. The U.S. firms, Milipore, Inc. and Hewlett-Packard Company, for example, are market leaders in their specialized fields. Most major U.S. medical equipment suppliers were selling in Iran through one of the several Iranian sales representatives.

Beckman Instruments Inc. is one of the leading individual suppliers of medical instruments to the Iranian market. Other U.S. suppliers such as Applied Science Laboratories, Inc., Labline, Inc., and Cole-Parmer Instrument Co. are also major suppliers of laboratory equipment.

The leading medical equipment suppliers are listed by category below:

#### **Electro-medical Equipment**

Hewlett-Packard Co. (U.S.)  
Fukuda Co. (Japan)  
Milipore, Inc. (U.S.)  
Hillige GmbH (West Germany)  
Lindsey and Masters Ltd. (U.K.)  
Capecraft Ltd. (U.K.)  
Shimatso Co. (Japan)  
Vebeco GmbH (West Germany)  
Escalop GmbH (West Germany)  
Instrumentation Laboratories, S.A. (Italy)

#### **Laboratory Equipment**

Cole Parmer Instrument Co. (U.S.)  
New Brunswick Scientific Co. (U.S.)  
Barnstead Co. (U.S.)  
Cambridge Ltd. (U.K.)  
Labline, Inc. (U.S.)  
Retsch GmbH (West Germany)  
Linseis GmbH (West Germany)  
Applied Sciences Laboratories, Inc. (U.S.)  
Coulter Electronics, Ltd. (U.K.)

Griener Electronics S.A. (Switzerland)  
Varian Associates (U.S.)  
Instrumentation Laboratories S.A. (Italy)  
**X-ray Equipment**  
Toshiba Co. (Japan)  
General Electric Co. (U.S.)  
Siemens AG. (West Germany)  
Philips (Holland)  
Cardstechnic S.A. (Austria)  
Generale di Elettrocita S.p.A., Cia. (Italy)

#### **General Equipment**

Mitsubishi Ltd. (Japan)  
Bennett Co. (U.S.)  
Travcnol Laboratories, Inc.  
(dental equip.) (U.S.)  
Narco Scientific Industries Inc. (U.S.)  
C. R. Bard, Inc. (U.S.)  
Killer, Ltd. (U.K.)  
Tublinger GmbH (West Germany)  
Clement Clark, Ltd. (U.K.)  
Siemens GmbH (West Germany)  
Cardstrechnic S.A. (Austria)  
American Sterilizer Co. (U.S.)  
Corning Glass Works (U.S.)  
Medicor (Hungary)  
Orian S.A. (Switzerland)  
British Oxygen, Ltd. (U.K.)  
Shimatsu Co. (Japan)

## **Marketing Factors**

Most medical equipment is sold in Iran either by Iranian sales representatives or by the offices of the foreign manufacturers established in Iran.

Approximately 80% of all medical equipment is sold through Iranian sales representatives. These representatives tend to sell a full range of medical equipment rather than to specialize in a particular type (see table 6). It should be noted, however, that the large equipment tenders for the Ministry of Health and Welfare's new hospitals will stipulate that a commission cannot be paid to a local representative.

About 10 to 15% by value of medical equipment sold in Iran is supplied by large foreign manufacturing companies with branch offices in Iran. For example, General Electric (U.S.), Siemens (West Germany) and Hewlett-Packard (U.S.) all maintain their own sales and service staffs in the country. Companies selling high-value and technically advanced equipment which requires specialized maintenance have found it essential to establish their own offices in Iran to ensure sales. Direct sales by foreign manufacturers to Iranian users accounted for only about 5% of total market sales in 1976.

During 1973-75, price became a secondary consideration for most Iranian purchases of medical equipment. During this period, government medical organizations had more money in their budgets than could be spent as a result of the huge increase in national income from petroleum sales. By 1976, however, budgets were reduced and credit terms and price for large equipment orders had become



**Table 6.—Iran: Leading Medical Equipment Representatives**

Name of Company	Lines Handled
Soofer Company Khark Street Shah Reza Ave. Tehran, Iran	Medical Laboratory Equipment Cardiological Equipment
Iran Bedashte 118-122 Tahkte-Jamshid Ave. Tehran, Iran	Laboratory Instruments
Tektron Company Abbassabad Ave. Pakistan Street 2nd Kuche Tehran, Iran	Medical and Laboratory Equipment
Shahla Company 146 Tahkte-Jamshid Ave. Tehran, Iran	Laboratory Instruments
Tehran Medix Company P.O. Box 204 Tehran, Iran	Medical Instruments and Equipment
Motamed Company 196 Shah Reza Ave. Tehran, Iran	General Medical Equipment and X-ray Equipment
Advance Medical Ltd. 20th Street No. 61 Shah Abbass Kabir Ave. Tehran, Iran	Medical Systems and Equipment

important factors in purchase decisions by government medical organizations.

Speed in delivery was the primary consideration in 1974/75. Suppliers who could deliver rapidly did business; those who could not were simply not considered. During this period inadequate consideration was given to maintaining stocks of spare parts, and to whether imported equipment could be serviced by available technicians. By late 1975 and in 1976, medical organizations were becoming less willing to buy from companies that had no servicing capabilities in the country. While some Iranian sales representatives maintain a stock of spare parts and have the capability to service medical equipment, the majority do not. This was not a serious problem until the mid-1970's when medical equipment imports began to rise rapidly.

Iranian medical authorities now investigate the servicing capability of the vendor and do not purchase unless satisfied that maintenance is available in Iran. Some government organizations which operate medical facilities, such as the Imperial Order of Social Services, have begun contracting the maintenance and servicing of medical equipment to private service companies located in Iran.

Electrically operated medical equipment sold in Iran must be adapted to operate on the Iranian 3 phase, 220 volt, 50 cycle system. Iranian customs duties on imported medical equipment range from

5 to 25% of the c.i.f. cost. Government organizations are exempt from customers duties, but all private medical institutions must pay them. Until the late 1960's almost all medical equipment was sold through traditional traders who imported from foreign suppliers and often sold only to a limited circle of known contacts. These traders generally did not have either an experienced sales force or technical service capabilities necessary to develop continuous sales of modern medical equipment. During 1976, some of these traders were still in business, but the volume of their sales was almost insignificant. During the mid-1970's major foreign suppliers had begun setting up their own sales/service organizations in Iran. While this is expensive, the effort clearly pays off in terms of increased sales.

Methods of sales promotion in Iran are quite limited. The Iran Medical Association located at 40 Sarshar Street, Tehran, publishes a monthly bulletin, but this does not contain advertisements. There are a number of professional journals that accept advertising. The best among these publications is the *Medical and Pharmaceuticals Weekly* with offices located at 690 Shahreza Avenue, Tehran. This is a privately run publication with a circulation of 7,009. These publications are in addition to a monthly magazine, the *Family Medical Magazine*, Postal Zone 14, Tehran. It has a monthly circulation of 6,000. Other publications that accept advertising are the *Mental Health Magazine* with a circulation of 1,000, *Medical News Weekly* and the *Journal of Iranian Dental Association*, published bimonthly. A biennial medical equipment trade fair "Iran Med" is held at the Tehran International Trade Fair facility; last held in 1976, it is scheduled again for November 1978.

Because of the high expense involved, smaller medical equipment companies cannot afford to establish their own sales and service office in Iran. These suppliers normally appoint an Iranian sales representative. In such cases, suppliers should be aware that marketing approaches practiced in their own countries are relatively new to Iran. Suppliers should provide extensive training on the operation of their equipment to Iranian sales representatives, and support them with frequent visits and adequate supplies of technical sales materials. One method of increasing sales is by using special product demonstrations that can be held for potential purchasers. Lack of knowledge about particular product characteristics can be overcome in this manner. Most representatives are weak in explaining the technical aspects of medical equipment.

The Government has set fixed commissions for medical equipment sales at 15% of sales value, but some suppliers have paid higher amounts.

## **COMPETITIVE POSITION OF U.S. SUPPLIERS**

Approximately 30 U.S. medical equipment suppliers are represented in Iran. The number of U.S. firms represented has been growing at a rate of about six firms per year since 1973. Most U.S. firms ship directly from their manufacturing plant in the United States to Iran; but several large multinational companies supply Iran from plants outside the United States. U.S.-based multinational companies supplying Iran from other countries including General Electric Company which is shipping X-ray equipment from Italy, Hewlett-Packard which supplies Iran from Switzerland, the Perkin-Elmer Corp. which ships from Britain. U.S. medical equipment has a number of advantages in the

Iranian market. About 20% of Iranian physicians have studied in the United States and prefer to purchase the American equipment with which they are familiar. In addition, the U.S. medical equipment industry is recognized in Iran as the world leader in development of new equipment and management of medical services. Specialized U.S. medical service companies which are well known to Iranian medical authorities include Charter Medical Company, American Hospital Supply Corp., and Sybron Corp.

In improving their share of the growing Iranian medical and health care equipment market, U.S. suppliers should develop marketing strategies which emphasize strengthening their sales representation and service capabilities, and intensifying the scope of their promotion efforts.



# Metallurgical and Metalworking Industries

THE GOVERNMENT of Iran has assumed the principal responsibility for the development of the primary metals industry. The investments required to develop large steel, copper, and aluminum complexes are of such magnitude that it is felt the Government is the only entity capable of accomplishing such projects. However, there are plans to encourage private investment in secondary industries to produce both semifabricated and finished metal products.

The primary metals industry in Iran has entered a period of rapid growth. In 1975, Iran produced nearly 600,000 tons of steel, 42,000 tons of aluminum, and 1,800 tons of copper. Projects planned are expected to raise these figures to 10 million tons of steel, 150,000 tons of aluminum, and nearly 150,000 tons of copper by 1980. Such projects will employ the most advanced technology. Capital expenditures for development of the primary metals industry will rise from \$261 million in 1975 to an estimated \$860 million in 1980. Further expansion is likely after 1980. The Government will be able to undertake a systematic approach to development of the industry as a result of a major

study of mineral resources being completed by the Geophysical Survey of Iran.

The three major metal products industries as defined in the Government's development plans are: The mechanical engineering, electrical engineering, and automotive industries. They have had a combined growth rate of over 37% during the 1973 to 1975 period. During the 1976 to 1980 period, it is estimated that these industries will grow at approximately 20% annually. Annual capital expenditures in the metal products industries are expected to rise from \$221 million in 1975 to \$450 million in 1980.

There will be excellent opportunities for the sale of technology and equipment to be used in the development of the metallurgical and metalworking industries. Despite the rapidly growing local manufacture of industrial equipment and machine tools, U.S. firms will have increased opportunities to supply specialized machinery and equipment. Imports of equipment and machinery are projected to grow from approximately \$200 million in 1975 to almost \$500 million in 1980.

## Primary Metals

### STRUCTURE AND SIZE

As late as 1970, the only primary metals production facilities in Iran consisted of a small (3,000 tons per year) government electrolytic copper smelter in Abassabad, Khorasan, and one government-owned lead concentrator located near Esfahan. In the 1960's, the Government determined that a heavy capital commitment to primary processing facilities was vital both for future industrial expansion, and for reducing the growing level of imports of metals and metal products. Such imports reached over \$2.3 billion in 1975. The value of primary metals production in 1976 was an estimated \$670 million, more than triple the 1973 figure (see table 1). Capital expenditures for primary metal production in 1970 were approximately \$70 million. By 1975,

capital expenditures had risen to \$261 million, and \$433 million was committed for 1976. Investment by the National Iranian Steel Company for the initial development and later expansion of the Aryamehr steel complex in Esfahan accounted for nearly 25% of total capital expenditures during 1970-75. Investment in other steel complexes and aluminum smelting made up the balance.

### Steel Production

Prior to 1973, when the country's first steel mill began operation, Iran imported all its iron and steel requirements. Consumption was about 2 million tons in 1972, 3.5 million tons in 1974, and over 5 million tons in 1975, of which 4.5 million tons valued at \$2.1 billion were imported (see table 2).

**Table 1.—Iran: Basic Metal Industries Growth Indicators**

	1970	1973	1974	1975	(estimated) 1976	1980
Capital expenditures (millions of U.S. dollars) .....	70	153	215	261	433	850
Employees .....	3,312	5,738	6,256	6,380	6,900	10,000
Steel production (thousands of tons) .....	<sup>1</sup> 90.1	256	260	580	620	10,000
Copper production (thousands of tons) .....	2.6	3.6	1.6	1.8	2.0	147
Aluminum production (thousands of tons) .....	—	—	30	42	43	85
Value of basic metals production (millions of U.S. dollars) .....	119	202	235	470	670	9,750

<sup>1</sup> Basic steel products manufactured from scrap and imported pig iron only.

Source: Ministry of Industry and Mines, Central Bank of Iran, estimates based on trade interviews.

Construction of the first steel complex, the Aryamehr Steel Mill, was begun at Esfahan in 1969, and the mill began production in March 1973 (see table 3). The National Iranian Steel Company was formed by the Government to develop and operate the Aryamehr steel plant. It is also responsible for the development and operation of coal and iron mines to supply the Iranian steel industry.

The Aryamehr Steel Mill was built with technical assistance from the U.S.S.R., and the initial investment of \$286 million was financed at 2½% by the Soviet Government. In return for this financial assistance, the Soviet Union received a commitment from Iran for repayment in the form of natural gas piped to the Soviet Union via Azarbaijan in the northwest of Iran. (See chapter on Mining, Petro-

**Table 2.—Iran: Imports of Basic Metals**  
(thousands of tons/thousands of U.S. dollars)

	1973		1974		1975	
	Weight	Value	Weight	Value	Weight	Value
Iron and steel and articles thereof .....	2,286.3	674,468	2,886.5	1,294,794	4,464.1	2,105,797
Copper and copper articles .....	24.1	41,691	24.1	65,262	38.6	74,179
Nickel and nickel articles .....	0.3	1,124	0.5	1,479	0.6	2,795
Aluminum and aluminum articles .....	14.2	18,125	16.2	31,012	33.1	58,991
Magnesium and beryllium articles .....	0.2	222	0.1	118	0.3	769
Lead and lead articles .....	5.1	2,661	6.2	4,599	1.1	2,041
Zinc and zinc articles .....	7.6	5,322	4.6	518	9.3	8,755
Tin and tin articles .....	0.8	3,149	0.7	4,510	0.7	3,194
Other base metals and articles .....	2.3	1,656	0.7	2,425	0.4	2,588
Tools implements, cutlery, spoons and forks of base metals .....	9.1	25,370	10.4	34,206	13.0	52,248
Miscellaneous articles of base metals .....	10.9	19,116	13.3	25,170	14.2	38,568
Totals .....	2,360.7	792,904	2,963.1	1,468,885	4,575.4	2,349,911

Source: Official Iranian Trade Statistics.

**Table 3.—Iran: Major Primary Metal and Basic Metal Products Manufacturers, 1976**

Company	Date of Establishment	Location	Products and Capacity
Ahvaz Pipe Mills Co. (National Iranian Oil Company) ..	—	Ahvaz	Medium and wide diameter pipe for petroleum industry, 100,000 tons per year.
Ahvaz Rolling and Pipe Mills Co. ....	1972	Ahvaz	300,000 tons annually of skelp and strip used primarily for welded steel pipe up to 6" in diameter and rolled steel cable.
Alum Pars .....	1975	Arak	46,000 tons annually of cold rolled aluminum products
Aryamehr Steel Mill (National Iranian Steel Company)	1969	Esfahan	Steel girders, rod and other profiles 600,000 tons annual capacity
Iranian Aluminum Company .....	1973	Arak	45,000 tons of aluminum ingots per year
Iran Rolling and Machinery Co. ....	—	Tehran	60,000 tons of cast pipe and fittings per year
Khuzistan Metal Industries .....	—	Ahvaz	15,000 tons of galvanized wire and fencing per year
Shahriar Pipe Rolling Co. ....	1973	Ahvaz	120,000 tons of seamless pipe per year
Shahriar Rolling Mills Co. ....	1967	Ahvaz	150,000 tons of plate steel per year
Shahriar Steel Mills Company .....	1970	Ahvaz	200,000 tons of steel bars and channels annually
Shahriar Wire Rod Mill Co. ....	1970	Ahvaz	120,000 tons of steel rod and wire annually
Shoush Steel Plant Co. ....	1970	Ahvaz	210,000 tons of steel ingots per year

Source: Trade interviews.



leum and Natural Gas extraction.) Production of the Aryamehr Steel Mill began with one 1,033 m<sup>3</sup> volume blast furnace having production capacity of 1,600 tons of pig iron a day, two 80-ton converters and a continuous casting unit which has the capacity to produce 550,000 tons of primary steel products per year. The plant's rolling mills have a production capacity as follows:

Steel rods, 10-15 mm dia.	70,000 tons/yr.
Steel bands, 20-40 mm thick and 20-200 mm wide	20,000 tons/yr.
Angles, 2-20 gauge	35,000 tons/yr.
Channels, 5-30 gauge	234,000 tons/yr.
Profiles, size 5-30 gauge	11,000 tons/yr.
Rails, 8-24 kg/linear meter	5,000 tons/yr.
Straps, 20-50 mm wide and 2-3.5 mm thick	5,000 tons/yr.
Reinforcing bars, 5.5-10 mm dia.	50,000 tons/yr.
Miscellaneous rolled steels	70,000 tons/yr.

The mill also has a 440,000-ton per year coking plant which produces 60% of the mill's requirements. Also included in the complex are a refractory materials plant, a 152,000 ft<sup>3</sup>/day oxygen production plant and a large spare parts workshop. The development of this steel mill also has spurred exploitation of coal and iron deposits in Iran.

In 1976, plans were underway to increase plant capacity from 600,000 tons to 1.9 million tons by 1980. Cost of the expansion will run over \$900 million. It is expected that a further modification of the plant will begin in 1980, and by 1985 the mill is expected to produce 4 million tons of pig iron and structural steel products per year. In 1975 the Aryamehr Steel Mill produced 580,000 tons of steel and employed over 10,000 people. Production that year was sold in the domestic market for \$272 million.

A second steel complex located at Ahvaz in the province of Khuzistan was slated to begin limited production in early 1977. This complex is one of six planned direct-reduction steel mills to be built by a second state-owned company, the National Iranian Steel Industries Company (NISIC). This company was created by Imperial Decree in 1973, specifically for the purpose of producing steel by use of the direct reduction method. By March, 1983, the end of the Sixth National Development Plan, NISIC should be producing 11 million tons of steel annually. The Ahvaz Mill, like the other direct reduction mills to be built, will use natural gas from nearby fields. The mill will produce 2.8 million tons of steel upon completion; one stage was producing in early 1977. The mill includes a continuous steel-casting unit being constructed by Sumitomo Machinery Co., Ltd. of Japan under a \$40 million contract. In addition, Sumitomo has supplied equipment for two slab lines and one steel

bloom line. Technical guidance for the steel-casting unit will be provided by Nippon Kokan Kabashiki Kaisha with metallurgical quality control by Con-Cast S.A. of Switzerland. The Ahvaz Mill is actually a complex of three direct reduction mills, each using a separate production process. One mill with a 1.2 million metric ton capacity uses the Midrex method, originated by Midland-Ross Corp. of the United States and later acquired by Korf-Midland-Ross Holding AG. of West Germany. The second mill with a capacity of 1 million metric tons per year and using the HyL reduction method is being supplied by its originator, Swindell-Dressler Corp., subsidiary of the Pullman Corporation, of the United States. The third mill, with an annual capacity of 400,000 metric tons, uses the "Purfar" method and is supplied by Thyssen Rohrenwerke AG., subsidiary of August Thyssen-Hutten AG., of West Germany. The "Purfar" method being used at Ahvaz is the prototype for Thyssen, not having been employed elsewhere in the world. Thyssen supplied the plant with a total guarantee that it would perform satisfactorily, and it began trial production in early 1977. Total investment for the Ahvaz complex is estimated to be \$800 million, \$500 million of which is planned to be spent for equipment.

The Shahriar Industrial Group has been the most active private firm in the primary metals industry. The Shahriar group has invested in a complex of eight plants in Ahvaz which produce a variety of steel products, including pipes, profiles, and reinforcing rods. The complex incorporates four blast furnaces and relies on scrap iron and purchased steel for feed stock. Ultimately, the Shahriar plants will process sponge iron obtained from NISIC's direct reduction steel mill in Ahvaz. Among the plants in the Shahriar complex, the Shoush Steel Plant Co., has an annual production capacity of 210,000 tons of steel ingots. The plant began production in 1974. The Shahriar Steel Mills Co. has an annual capacity of 200,000 tons of structural steel, mostly bars and channels, and represents capital investment of \$34.1 million. Production in 1975 was 90,000 tons. A second plant in the complex is the Shahriar Rolling Mills Company. This \$25.1 million plant has an annual capacity of 150,000 tons of plate steel. However, as a result of raw material shortages production in 1975 was only 44% of capacity, and 1976 production was also below capacity. The Shahriar Pipe Rolling Mill Co. was established in 1973 with a capital investment of \$32.7 million and has a production capacity of 120,000 tons per year of seamless steel pipe. Production in 1977 is expected to be only about 30,000 tons. The Shahriar Wire Rod Mill Co., established in 1970, has an annual production capacity of 120,000 tons of steel rod and wire.

The National Iranian Oil Company operates a pipe rolling plant in Ahvaz, the Ahvaz Pipe Mills Company. This plant has a production capacity of 100,000 tons of 6" to 48" diameter steel pipes per year, which is being increased to 400,000 tons per year. Most of this production is destined for oil and gas projects within the country. Another firm, the privately owned Ahvaz Rolling and Pipe Mills Company, has annual production capacity of 300,000 tons of skelp and strip which is partially used in the welded pipes also made in the plant. Another privately owned plant in Ahvaz is the Khuzistan Metal Industries, which produces galvanized wire and fencing. The Iran Rolling and Machinery Co. in Tehran has a production capacity of 60,000 tons annually of cast iron pipes and fittings.

### **Aluminum Production**

The Iran Aluminum Company (IRALCO) is a joint venture between Reynolds Metals Co. of the United States which holds 12½%, the Government of Pakistan which holds 5%, and the Iranian Government investment and holding corporation, Industrial Development and Renovation Organization (IDRO) which holds the remainder of the equity. The plan for developing an aluminum plant was originally conceived within the framework of the Regional Cooperation for Development, in which the Governments of Iran, Turkey, and Pakistan have undertaken a number of joint industrial and infrastructure projects. Construction of the \$45 million plant was completed in 1973 when 30,000 tons of ingots were produced from alumina imported from Australia. In 1975 IRALCO produced 42,000 tons of ingots of which 26,000 tons were sold to local fabricators and the remaining 38% was exported to countries in the Far East. IRALCO is expanding production and by 1979 it will be capable of producing 120,000 tons of aluminum ingots annually. The cost of this expansion is expected to reach \$56.8 million.

Alum Pars Company, a privately owned aluminum conversion company will be Iran's largest producer of aluminum sheets and foil. Scheduled to begin operations in 1977, the company plans annual production of 10,000 tons of aluminum laminate and printed foil; 30,000 tons of aluminum corrugated and painted sheet; 6,000 tons of aluminum irrigation pipes; and aluminum packaging materials (the amount to depend on demand). All machinery for this plant was purchased from Techmo-Hunter S.p.A. of Italy.

### **Copper Processing**

In mid-1976, there was only one copper smelter in operation in Iran which belonged to the Military Industrial Organization. The smelter was built in



*Casting aluminum ingots at the IRALCO plant.*

the 1950's and its equipment is now obsolete. In 1977, the state-owned National Iranian Copper Industries Corporation was building a refining plant as part of the processing facilities for the \$400 million Sarcheshmeh Copper Mine near Kerman. The refining facility, expected to begin operations in 1979, will produce 150,000 tons of 99.7% metallic copper to feed intermediate plants for the production of copper products. (See Mining, Petroleum and Natural Gas Extraction chapter.)

### **Other Primary Metals Processing**

In 1969, the Government of Iran put into operation a lead concentrator near Esfahan, representing a capital investment of \$2.48 million. This plant concentrates 8,000 tons of metallic lead per year, processing raw materials from both government and privately operated lead and zinc mines in the area.

### **Government Organizations**

The Ministry of Industry and Mines has chief responsibility for the development of the Iranian primary metals industry. Almost all major projects for primary metals production are within the public sector and a number of state-owned companies have been formed to implement these projects. The major state-owned companies engaged in primary metals



production are: the National Iranian Steel Company, the National Iranian Steel Industries Company, the National Iranian Copper Industries Company, and The Iran Mining and Smelting Company.

The Ministry of Commerce is responsible for assuring that adequate amounts of finished products, such as girders and other steel products, are in sufficient supply in the country. It performs this task by regulating tariffs and implementing measures to control imports. Importers must apply to the Ministry of Commerce for authorization to import steel products.

## TRENDS, PROGRAMS, AND PROJECTS

The Government of Iran's heavy investment in the production of primary metals has developed since 1965. Iran's Fourth National Development Plan (1967/68–1972/73), allocated, approximately \$280 million to the National Iranian Steel Company for the building of the first steel mill in Esfahan. The Industrial Development and Renovation Organization (IDRO), had majority participation in the first aluminum smelter in the country. Primary metals development projects in the Fourth Development Plan were budgeted at a total of \$337 million, but final costs to complete the projects were 20% above that amount.

During the Fifth National Development Plan (1973/74–1977/78), the Government greatly increased its direct involvement in the primary metals industry. All important mineral resources such as coal, iron ore, and copper were nationalized in 1975. It was decided that the Government would take the initiative in the necessary investments for the infrastructure development, exploitation, and processing of primary metals, most notably steel and copper. The Government hopes that secondary metals production projects will be developed by private sector investors. Based on the Government's plans for construction

of new steel plants in Khuzistan province, the Shahriar Industrial Group, a private corporation, has greatly expanded its rolling mill capacity in Ahvaz. A number of state-owned corporations have been formed to exploit the nationalized mines and newly discovered deposits, as well as to establish new basic metal processing facilities. For example, the National Iranian Copper Industry Corporation invested over \$459 million during the 1974–76 period for the development of the Sarcheshmeh Copper project alone (see table 4). The National Iranian Steel Company allocated \$780 million in development credits from 1974 to 1976 for expansion of the Aryamehr Steel Mill. The National Iranian Steel Industries Corporation's fixed capital investment budget was increased from \$70.6 million in 1974 to \$178.9 million in 1976 for the five direct-reduction steel plants it was developing. It is expected that the capital investment budget of this agency will rise to \$400 million by 1980. According to Fifth Development Plan projections, consumption of steel is to double during the plan period from about 2 million tons in 1972/73 (last year of the Fourth Plan period) to 4.2 million tons in 1978. Other estimates project growth in consumption of 20–25% per year during the 1973–83 period to 12–18 million tons in 1983. The steel mill projects under construction or planned for completion during the Sixth Plan (1978/79–1982/83) period are projected to bring production up to 14–17 million tons annually, which would make Iran self-sufficient in basic steel products.

Iran's Fifth National Development Plan sets a goal of 10 million tons of steel to be produced by the end of the Plan period (March 1978). While the Soviet-built steel mill in Esfahan uses conventional production technology, the Government has made a commitment to using the direct reduction process in its new mills in order to exploit Iran's extensive

Table 4.—Iran: Primary Metals Projects

Projects	Present Capacity (thousand tons)	Planned Capacity (thousand tons)	Completion Year	Allocation (Millions of U.S. Dollars)	Production
<b>ALUMINUM</b>					
Iranian Aluminum Co. (expansion) .....	45	120	1982	458.6	Ingot/bars
<b>STEEL</b>					
Aryamehr Steel Co. (expansion) .....	600	1,900	1978	900	
Ahvaz Steel Co. ....	330	2,900	1977	800	
Esfahan Steel Plant .....	—	1,200	—	1,000	Structural steel
Bandar Abbas Steel Plant .....	—	2,900	1979	3,000	Sheet steel, steel profiles
Mashhad Steel Plant .....	—	400	—	N.A.	
Kavian Steel Co. ....	—	1,000	—	50	Ingot/bloom, sheet products
Bushehr Steel Plant .....	—	2,500	1980	N.A.	
Iran Special Steels Co. ....	—	220	—	4.2	Special steels
<b>COPPER</b>					
Sarcheshmeh Copper Refinery .....	—	150	1979	400	Copper metal

Source: Ministry of Industry and Mines, Central Bank of Iran, estimates based on trade interviews.

natural gas reserves. Most of the direct reduction plant projects will be constructed and operated by the National Iranian Steel Industries Corporation (NISIC). The first project undertaken by NISIC was the steel mill in Ahvaz which began production in 1977.

In 1976 an agreement was also signed with an Italian consortium, IRI, represented by Construzioni Metalliche Finsider S.p.A., for the development of a direct reduction steel complex to be located at Bandar Abbas on the Persian Gulf. Finsider, one of the firms within the IRI Group, controls 80% of the Italian steel industry. The project will consist of direct reduction furnaces with a total capacity of 3 million tons per year. Investment in this project will be approximately \$3 billion. The plant will employ a total of 9,500 people and produce hot and cold rolled steel sheets for use in the construction, automotive, and shipbuilding industries. Consulting engineering services are being provided by a joint venture, Iritek Engineers, the participants of which are Italmimpianti of Italy (45%), NISIC (45%) and the Industrial Mining and Development Bank of Iran (IMDBI, 10%). In early 1977, the basic design work for the Bandar Abbas plant was completed and tender notices for the process design and construction of the complex were scheduled to be issued.

Plans are underway for a direct reduction, gas-operated steel mill to be located near Esfahan with an annual capacity of 500,000 tons of a wide range of structural steel. British Steel Corporation (BSC) of the United Kingdom was awarded the overall planning contract for this project and also won a \$54 million contract for management, technical assistance, and training services during construction and initial operations. BSC has retained McLellan P&W. Ltd. as engineering consultants. Total cost of the complex is estimated at \$980 million, and it will employ 3,000 persons when in full operation in 1980.

In addition to these projects, there are other direct reduction steel complexes being planned by NISIC, one at Bushehr, 2.5-3.0 million tons/yr. and another at Mashhad, 400,000 tons/yr. These projects were in the planning stage during 1977. NISIC has also established the Iran Special Steel Company, a joint venture with the French firm, Creusot Loire, to build and operate a plant producing some 200,000 tons annually of special steels using NISIC produced sponge iron.

Kavian Steel Mill Company, a joint venture made up of Ahvaz Rolling Mill Co., NISIC, and a group of private investors, is expected to be producing at its new steel mill by mid-1979. Total investment in the mill will be almost \$50 million and it will produce approximately one million tons of ingots, blooms, steel sheets, and plates.

Shahriar Rolling Mills is planning to increase production to 120,000 tons of seamless steel pipe per year under a \$12.5 million expansion program. The expanded rolling mill will also produce 300,000 tons of steel coils and straps and 80,000 tons of pipe of various types and diameters. The Iranian Aluminum Company is undergoing a \$57 million expansion project to raise its annual production capacity from 50,000 tons to 120,000 tons. Much of the equipment used in this expansion is being supplied domestically by the Arak Machine Tool Plant (see below). Ingots produced from the Iranian Aluminum Company will be sold primarily in Iran to secondary aluminum producers, with the remainder being scheduled for export. The Government plans further development of aluminum production capacity to 300,000 tons/yr. In connection with the development of the Sarcheshmeh Copper mines, there are plans to develop secondary industries for the production of semifinished and finished copper products, but no actual projects had been approved as of early 1977. In 1974, preliminary studies were undertaken by Imperial Metal Industries Ltd. of the United Kingdom and the Industrial and Mining Development Bank of Iran to investigate the feasibility of a plant to produce copper and copper alloy products.

## GROWTH PROSPECTS

It is clear from the increasing Government commitments that a high priority has been given to the development of the basic metals industries in Iran. The Government plans that 10 million tons of steel will be produced by 1978. Projects have been conceived, contracts let, and sufficient money allocated to achieve this goal. Many of the projects, however, have fallen behind schedule. The production target of 10 million tons will probably not be met before 1980, 2 years behind schedule. Despite delays in the large government projects, the achievements are impressive when compared with the 1975 production of 600,000 tons.

For the copper industry, the original government plans were to produce 145,000 tons of copper in 1978. The Sarcheshmeh Copper project, which was to provide all of this amount, fell approximately 2 years behind schedule, but it is expected to reach full planned production in 1980. This one project will make Iran the seventh largest copper-producing country in the world.

Development of the primary metals industry will remain almost completely controlled by the Government through the 1980's. In general, the private sector has not been quick to invest in smelting and primary metals manufacture. The Shahriar Industrial Group, which invested heavily during the mid-



1970's in steel manufacturing and rolling mills, experienced serious production stoppages during 1975 and 1976, due to a shortage of raw materials. Importation of scrap iron during the period became infeasible due to high costs and port congestion, and the anticipated source of sponge iron did not materialize because of delays in the government's direct reduction steel project in Ahvaz. Problems in planning and delays in implementation of the government projects have caused the private sector to adopt a conservative attitude vis-à-vis investments in primary metals projects. The Government, however, has taken the initiative and the Bander Abbas and Esfahan projects include rolling mill facilities to produce steel plates and profiles. Annual government capital expenditures in primary metals manufacture are expected to rise from \$547 million in 1975 to over \$1 billion in 1980.

The trend toward greater involvement in the in-

dustry by the Government will, in all likelihood, continue through 1980. However, government planners foresee that during the Sixth National Development Plan period beginning in 1978, greater effort must be expended in gaining participation of the private sector, indicating that the present policy of government investment and control is to be phased out in the long term.

Iran has vast deposits of ores which provide the potential to greatly expand its metallurgical industry. The projects planned during the period of the Fifth National Development Plan through March 1978 have been limited to the exploitation and refining of copper, iron, and aluminum, and none have been planned for exploiting other ores. As a result of the extensive geological survey work being carried out, however, it is expected that a comprehensive metallurgy expansion program will be included in future development plans.

## Metal Products Fabrication Industry

### STRUCTURE AND SIZE

Iran's use of iron, steel, and other metals has grown an average of 40% per year during the 1973 to 1976 period. There are an estimated 250 large industrial units in Iran with 100 or more employees and approximately 35,000 smaller factories and workshops producing metal products. The use of steel for construction purposes grew from 530,000 tons in 1970 to 2.3 million tons in 1975. Growth has been particularly rapid since 1975 when the Government began to infuse a greater amount of capital into the construction industry by providing loans and other incentives. The largest metals products industries in Iran are the manufacturing of vehicles, consumer durables, structural metals, and industrial machinery.

### Automotive Manufacturing

The demand for passenger cars, buses, trucks, and tractors grew rapidly during the 1970 to 1976 period. Production grew from 42,200 units in 1970 to 130,800 units in 1975 (see table 5 also Transportation chapter). In 1975 there were five manufacturers of passenger cars, five manufacturers of buses and minibuses, and eight manufacturers of trucks. There were already two producers of agricultural tractors in 1976 when the third, the Heavy Equipment Production Company (HEPCO) went into production. HEPCO produces a wide variety of heavy construction equipment under license of International Har-

vester Inc. of the United States and Sakai Ltd. of Japan.

Iran National Industrial Manufacturing Company was established in 1962 and began production of buses and minibuses under license of Daimler-Benz



*Peykan production line at Iran National.*

**Table 5.—Iran: Metal Products Industry Development Factors**

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>CAPITAL EXPENDITURES</b> (millions of U.S. dollars)						
Mechanical .....	13.8	30	49	96	93	200
Electrical .....	2.4	6	16	61	37	90
Automotive .....	16.0	7	47	64	80	160
<b>VALUE ADDED OF PRODUCTION</b> (millions of U.S. dollars)						
Mechanical .....	245	413	725	926	1,100	2,700
Electrical .....	135	295	379	457	550	1,000
Automotive .....	171	380	518	662	900	1,850
<b>OUTPUT OF SELECTED PRODUCTS</b>						
<b>Consumer Durables</b> (thousands of units)						
Refrigerators .....	160	257	309	437	492	850
Water Heaters .....	42	87	114	130	156	300
Space Heaters .....	100	219	307	336	370	630
Gas Stoves .....	197	313	291	327	375	700
Coolers .....	67	134	144	227	285	600
<b>Automotive</b> (thousands of units)						
Automobiles .....	30.0	52.3	73.0	97.0	131.0	263.0
Minibuses, Buses .....	2.4	3.0	3.3	3.4	4.9	8.0
Trucks .....	9.8	20.0	25.9	30.4	42.4	89.5
Total .....	42.2	75.3	102.2	130.8	178.3	360.5

<sup>1</sup> Estimates.

Source: Central Bank of Iran, trade interviews.

A.G. of West Germany. In 1967, Iran National started automobile assembly under license of Chrysler Ltd. of the United Kingdom, subsidiary of Chrysler Corp. (U.S.). The production of Hillman model automobiles rose from 3,000 in 1967 to 72,000 in 1976. The cars are marketed under the trade name Peykan. Iran National is the largest privately owned industrial firm in Iran, and its total capital investment is about \$600 million.

The number of domestic firms which fabricate parts and accessories for the automotive industry has grown during the 1970's (see table 6). Iran National has contracts with 40 Iranian manufacturers who supply parts for its cars, trucks, and buses. In 1975, 21% of Iran National's parts were supplied by domestic suppliers, and it is the industry leader in the use of locally fabricated parts and accessories. In 1976, as part of the effort to protect

the Iranian automotive industry, the Government issued a list of automotive parts manufactured in the country which require prior governmental consent before importation is allowed. This list includes all press-body parts, floors, frames, doors, hoods, and mudguards, bumpers, wiring, piston rings, upholstery, exhaust pipes, mufflers, shock absorbers, oil filters, ball bearings, and spark plugs.

Iran Citroen & Co. was established in 1968 and produced the Citroen Deux Cheveaux model automobiles under license of Citroen S.A. of France, the production of which rose from 4,350 in 1970 to 20,000 in 1975. Iran Citroen reached agreement with Renault S.A. of France to begin production of the Renault Model TL5 automobile and with its production, the company name was changed to Iran Renault Co. Production was originally scheduled to begin in 1976. However, production difficulties were experienced, and in early 1977, most Renault TL5 automobiles sold by the company were imported.

General Motors, Iran (GMI) is a joint venture between General Motors Overseas Corporation of the United States and private Iranian investors. GMI has been producing in Iran since 1974, and assembled three models of the Opel Kadett that year. Assembly of GMI cars, marketed in Iran as Iran Chevrolet, rose from 6,000 in 1974 to 10,000 in 1976. GMI will drop the Opel and introduce U.S. models in 1977 and begin assembly of GM trucks. In 1976 GMI began assembly of the Cadillac Seville in Iran.

**Table 6.—Iran: Representative Automobile Parts Producers—1976**

Name of the Company	Products
Iranian Bearing Company .....	Ball and roller bearings
Boukhan Manufacturing Co. ....	Coil springs
Fanar Manufacturing Co. ....	Automobile springs
Iran Automobile Equipment Co. ....	Spark plugs
Indamine Manufacturing Co. ....	Shock absorbers
Lent Tormoz Manufacturing Co. ....	Brakes
Iran Radiator Co. ....	Radiators
Zar Manufacturing Co. ....	Automobile springs
Reza Manufacturing Co. ....	Bumpers, wheels

Source: Trade interviews.



In 1976, British Leyland Motors Corp. Ltd. of the United Kingdom was producing a combined total of about 12,000 units per year of 12- to 18-ton trucks and double-decked buses in Iran. Zamyad Company assembles trucks under license of Volvobil AB of Sweden and Nissan Motor Co. Ltd. of Japan, producing 19- to 21-ton trucks. Iran Kaveh assembles Mack trucks up to a total of 100-ton capacity under license from Signal Companies Inc. of the United States. Mazda Company assembles "Mazda" (Toyo Kogyo Ltd., Japan) pickup trucks, and the capacity of this company was raised from 5,600 units per year to about 18,000 units per year in 1975 by addition of a second assembly line. Pars Lux Company, a subsidiary of the Military Industrial Organization, produced Magirus Deutz buses and minibuses under license at the rate of approximately 2,000 units in 1976. The Tabriz Diesel Engine Factory produced 14,000 engines in 1976 under license of Daimler-Benz. This company also has the capability of producing bodypress parts. Tractor Sazi Tabriz produces Perkins engines under license from Perkins Engines Group Ltd. of the United Kingdom, and Massey-Ferguson tractors under license from Massey-Ferguson Ltd. of Canada. A second tractor manufacturer, Iran John Deere Company, assembled 100 tractors and 85 combine harvesters in 1976. In all, there were eight manufacturers or assemblers of tractors and other agricultural equipment in 1976 (see also Agroindustry report in this survey).

### Consumer Durables Manufacturing

The consumer durables industry is one of the fastest growing segments of Iran's economy. There were 18 large companies producing consumer durables in Iran in 1976 (see table 7). The value of consumer durables production in 1976 was \$457

million, compared to \$135 million in 1970. The three largest producers in 1976 were Arj Corporation, Philver Manufacturing Company, and Azmayesh Corporation. All three of these firms produced a wide range of products including refrigerators, washing machines, and evaporation coolers. Almost all parts for consumer durables are fabricated in Iran including the pressed metal parts, plastic parts, and compressors. Some parts, such as the carburetors for space heaters, are imported. Two of the major bottled gas supplying companies, Butane Company and Iran Gas Co., are among the largest Iranian producers of gas stoves and ranges. A third major producer of gas ranges in 1976 was Ardel Home Appliances Inc. The Butane Company and another bottled gas supplier, Iran Cylinder Company, also press butane gas cylinders.

### Structural Metal Products Manufacturing

Most structural metal products used for construction in Iran were still being produced in small shops in 1976, but there were several large manufacturers of prefabricated structural steel products. Demand has grown rapidly, particularly during the 1974 to 1976 period. Major items being produced are window frames, doors, and door frames. There is a heavy demand for metal garage doors because the architecture of dwellings in Iran typically includes a walled yard, with a large metal door, capable of accommodating a passenger car. These are usually swing-type rather than overhead doors and are normally made to order. In 1976 there were approximately 20 large establishments producing metal profiles for doors and windows and an estimated 2,000 job shops in Iran which produce these structural metal products. The smaller job shops also

Table 7.—Iran: Consumer Durables Producers, Product, and Capacity in 1976

Name of the Company	Refrigerators	Gas Ranges	Coolers	Washing Machines
Arj Corporation .....	140,000	3,000	10,000	10,000
Philver Company .....	130,000	—	5,000	2,000
General Steel Company .....	80,000	—	—	—
Azmayesh Corporation .....	120,000	—	15,000	15,000
General Electric Corporation .....	80,000	—	—	—
General Industrial Corporation .....	20,000	—	8,000	2,000
Iranco (Pars Machine Manufacturing Company) .....	8,800	—	5,000	—
Universal Company .....	—	15,000	10,000	—
Saeed Varasteh Industrial Factories .....	—	20,000	10,000	—
Sanati Berelyan .....	—	—	15,000	2,000
Pars Toshiba .....	—	—	—	20,000
Lord Electronic .....	—	—	—	500
Pars and America Industrial Co. ....	—	—	—	10,000
Ardel Company .....	—	75,000	—	—
Butane Company .....	—	75,000	—	—
Iran Gas (Iran Cylinder Co.) .....	—	60,000	—	—
Zeh Company .....	—	3,000	—	—
Sanati Calori .....	—	40,000	—	—

Source: Ministry of Industry and Mines.

turn out most of the ornate wrought-metal products for architectural and furniture uses.

Demand for prefabricated structural steel products grew at an average of 32% per year from 1974 through 1976. The largest producer in 1976 was Iran Steel Building Corporation (Suliran), a member of the Behshahr Industrial Group, which had begun producing structural steel products in the early 1960's. The original product line of Suliran was based on the prefabricated structural steel products of Soule Steel Co. of the United States, which Behshahr Industrial Group had previously imported. In 1975, Suliran expanded its operations and in 1977 had a production capacity of approximately 24,000 tons of prefabricated steel beams and profiles annually. Suliran has a modern plant, and about one-third of its machining operations are automated by use of numerical and electronically controlled machine tools. Production capacity of Suliran is planned to increase to 35,000 tons by the beginning of 1978.

Shenaveh Marine Construction Incorporated, located on Abadan Island in Khuzistan, specializes in shipbuilding, ship repair and manufacture of marine equipment such as buoys and pontoons, it also produces a range of structural steel products such as barrage and embankment gates, storage tanks, vessels and containers for industrial use, towers for high tension power transmission lines, and machinery parts. Shenaveh builds barges and ships up to 6,000 d.w.t., performs drydock repairs on ships up to 2,000 d.w.t. and floating repairs on all types and sizes of ships. Shenaveh has a well-equipped shipyard, steel fabrication unit, and through a joint venture with a Swedish firm, Svermo AB, handles a wide variety of machinery fabrication and salvage work in its well-equipped machine shop and salvage unit.

## Machine Tools and Industrial Equipment

Many Iranian machine job shops and larger metals products manufacturing companies developed the capability of fabricating a wide variety of replacement parts for industrial and consumer machinery as far back as the 1930's, because of the country's distance from foreign suppliers. In addition, several small job shops developed the capability to fabricate small basic machine tools.

In 1976, there was still a large number of small job shops producing machine tools and parts, but several large firms had also been formed for the production of machine tools and industrial equipment (see table 8).

In the 1960's, the Government made concerted efforts to create a heavy machinery production industry. The government investment and holding company, Industrial Development and Renovation Organization (IDRO) set up two companies: the Arak Machine Manufacturing Company in 1966 and the Tabriz Machine Tool Company in 1977.

The Arak Machine Manufacturing Company (AMMC) produces a variety of machinery for heavy industry, including boilers, cranes, pressured and atmospheric steel tanks, railroad car components and railroad accessories, ore conveyors and processing equipment, and aluminum and steel refining and manufacturing machinery. In addition to the manufacture of machinery, it has produced numerous steel structures for the construction of factories, buildings, and bridges. AMMC was originally designed with the technical assistance of the U.S.S.R. and produced Soviet-designed machinery and equipment. All of the original equipment for AMMC was supplied by the Soviet Union. The plant facilities include a foundry, large well-equipped machine shops, a boiler room, compressed air facilities, and

**Table 8.—Iran: Representative Producers of Machine Tools and Primary Metals Machinery and Equipment**

Company	Date of Establishment	Location	Production
Arak Machine Manufacturing Company .....	1966	Arak	Industrial boilers, cranes, metallurgical equipment
Ferniaco Industrial Company .....	1971	Tehran	Wood-working, machine tools, metal working machinery, shears; hydraulic and mechanical presses, forming machines
Firouza Engineering Company .....	1966	Tehran	Metal working machinery, shaping machines, profile machines
Kiasti Factory .....	1972	Tehran	Spin machines, shears, 10 units per month
Martin Factory .....	1955	Tehran	Hydraulic industrial machines and machinery parts
(Mernia Machine Producing Company)			
Mechanism Industrial Company .....	1959	Tehran	Industrial machinery and molds
Rayco-Technique Company .....	—	Tehran	Mechanical and hydraulic presses, up to 1,000 tons. Punch machines, shears
Tabriz Machine Tool Company .....	1967	Tabriz	Machine tools, lathes, vertical saws, drills, grinding machines, presses
Tehran Machine Production Company .....	1966	Tehran	Shears, rolling mill equipment for copper mills, presses, 30 to 300 ton

Source: Trade interviews.



a training center capable of handling 500 students per year. Original equipment has been supplemented by the purchase of machine tools and test equipment from western European sources, including such items as a plasma arc tracing cutter, X-ray inspection units for welding seams, and numerically controlled machine tools. AMMC produces to order and its production method is that of a large job shop. Major projects which AMMC was undertaking in 1977 included production of most equipment for the expansion of the IRALCO plant in Arak, and fabrication of conveyors and other ore processing components for the Sarcheshmeh copper mines project.

In the mid-1970's, AMMC greatly expanded its production capabilities through licensing agreements with foreign suppliers. The foreign firms whose equipment AMMC produces under license include Wabco of the United States (construction and mining equipment), Harnischfeger Corp. of the United States (120-ton dump truck bodies), Combustion Engineering Inc. of the United States, (heat exchangers, pressure vessels, and industrial boilers), ESCO Corp. of the United States (special steel), John Thompson Ltd. of Great Britain (boilers), Kesting of West Germany, (production machinery for prefabricated housing), Salzgitter Maschinen AG. of West Germany and Polimex-Cekop Ltd. of Poland (machinery for the sugar industry).

The Tabriz Machine Tool Company (TMTC), wholly owned by Industrial Development and Renovation Organization, produces radial drills, small tool grinders, small milling machines, shaping machines, presses, and lathes, all under license of Skoda Plzen of Czechoslovakia.

Almost all of TMTC's own production equipment was supplied by Eastern European suppliers under the original agreement with Czechoslovakia. The plant facilities include a foundry equipped with an electric furnace, machinery shops, assembly shops, and heat treatment furnaces; it has its own power generators and well-equipped training facilities. In its expansion programs, TMTC will purchase from a wide variety of machinery suppliers.

TMTC produces most of its machines using a job shop system, although in the mid-1970's it had begun to modify the production of some of its products by adopting an assembly line system. TMTC also plans to expand production, from 8,000 tons/yr to 30,000 tons/yr, and has made licensing agreements with a number of foreign suppliers of machinery and other equipment: Cincinnati Milacron Ltd. of the United Kingdom, a subsidiary of Cincinnati Milacron Inc. (U.S.), for the production of medium-sized milling machines; Alfred Herbert Ltd. of the United Kingdom for the production of chucking machines and other machine tools; Conveyance Fork Trucks Ltd. of the United Kingdom

for the production of forklift trucks; Compressed Air Ltd. of the United Kingdom for the production of industrial compressors and; Klein, Schanzlin & Becker AG. of West Germany for the production of pumps and industrial valves. TMTC has also entered joint ventures with the Hawker Siddeley Group Ltd., of the United Kingdom for the production of diesel engines and with Gould Inc. of the United States for the production of electric motors and generators. In 1976, Gould sold its interest in this venture.

## **Other Metal Products Producers**

There is a large variety of producers of metal products in Iran; some producing finished products for sale and others producing semifinished products and parts under contract. It should be mentioned that Iran has a long history of metal working. A cottage industry of metal handicrafts still flourishes along with a wide range of small workshops employing basic machine tools for metal products fabrication, and the larger industrial producers of metal products. The following discussion is not comprehensive but includes those areas in which there has been the greatest level of industrial activity (see table 9).

Two companies, Pama Company and Pars Metal, manufacture enameled cast-iron wares. Two other companies, Pars La'ab and Mehr Afza Company, import castings which they enamel in their own shops. Shofazhkar Company, which is a manufacturer of heating equipment, is expanding into the production of enameled iron sanitary fixtures, particularly bathtubs and steel shower bases.

In 1976, there were two industrial manufacturers of sanitary fittings. The Iran Valve Now Company is a joint venture with Delta Metals Ltd. of the United Kingdom and produced 910,000 fittings in 1975. The Bronz Industrial Group, established in 1973, produced 615,000 fittings in 1975. The market is growing rapidly for sanitary fittings and both of these companies have expansion plans that will raise their combined production to 2.5 million units by 1980. There are numerous small workshops that produce brass and iron fittings by sand casting. It is estimated that half the fittings produced domestically in 1976 were made by these small workshops; but since consumers are purchasing higher quality products, the small workshops have been losing market share rapidly.

There were two large producers of malleable pipe fittings and cast-iron sanitary pipes in 1976. Pars Metal, which also produced enameled sanitary wares, produced cast-iron pipes, sewer pipes and sewer fittings. Malleable Iran Company produced malleable

**Table 9.—Iran: Representative Metal Products Manufacturers**

Company	Location	Date Established	Products
Abzaran Company .....	Esfahan	1958	Hand tools, wrenches, screw drivers, pliers
Ajir Company .....	Tehran	N.A.	Panel type radiators
Alyazhkar Company .....	Tehran	1968	Sand cast and dye cast products, false floor, metal panels and stands for computer rooms, hinges and other building hardware
Ama Industrial Company .....	Tehran	1959	Welding rods, grinding wheels, galvanized and plated metals, metal measuring tapes.
Alumtek .....	Qazvin	1973	Aluminum profiles, aluminum power cables
Areh Iran Co. ....	Tehran	1966	Saw blades
Atmosphere Co. ....	Tehran	1969	Air-conditioners, liquid chillers, fan coils, cooling towers
Azar Mikh Co. ....	Tabriz	1971	Steel nails
Azari Tank Producing Co. ....	Tehran	1937	Cylindrical tanks, water towers, 7 tons/day
Bahram Mahdair Tank Mfg. Co. ....	Tehran	1955	Cylindrical tanks, water towers
Carrier Thermofrig .....	Qazvin	1972	Fancoils, air-conditioners
Cyrus Arjomand Co. ....	Tehran	1957	Cylindrical tanks, tank truck bodies, metal structures, 20 tons/day
Daghigh Hydraulic Co. ....	Tehran	N.A.	Block making machines, hydraulic presses
Ervand Metal Industries .....	Ahvaz	1971	Metal office furniture
Escrow Company .....	Ahvaz	1971	Screws, rivets
Espid Company .....	Tehran	1962	Metal furniture, filing cabinets, metal hospital furniture
Estabil Engineering & Manufacturing Co. ....	Tehran	1970	Tanks, pressure tanks, steel towers
Farnia Company .....	Tehran	1968	Steel radiators, 150,000 m <sup>2</sup> /year
Givar Industrial and Production Co. ....	Tehran	1960	Steel profiles for doors and window partitions
Hefaz Metal Industries Co. ....	Tehran	1958	Steel office furniture, filing cabinets, shelving 500 tons/year
Ilgo Company .....	Tehran	1969	Steel wool
Iran Gulf Company .....	Tehran	N.A.	Cylindrical tanks
Iran Hinge Company .....	Tehran	1959	Hinges, 20,000 units/month
Iran Metal Industries Co. ....	Tehran	1969	Metal furniture, filing cabinets, metal shelving, hospital furniture, metal partitions 7,000 tons/year
Iran Machine Co. ....	Tehran	1966	Dumpers, concrete mixers large tanks, small tank trailers, water towers, standing water tanks
Iran Nail Company .....	Tehran	1958	Nails, 5,000 tons/year
Iran Pipe and Machine Products Company .....	Tehran	1970	Electric ceiling cranes, eccentric road rollers, steel structures for plants fixed and tipping tanks, cast pipes, truck bodies 12-ton capacity
Iran Profile Manufacturing Co. ....	N.A.	N.A.	Structural steel
Irisco Factory .....	Tehran	1953	Cylindrical tanks, trailers 350 units/year
J.D.F. Company .....	Tehran	1966	Cylindrical tanks, ceiling cranes, and moving cranes, metal structures 1,000 tons/month
Kaveh Group of Industrial Factories .....	Tehran	1922	Safes, 40,000 units/year, safe doors, 500 units/year, office furniture 30,000 units/year, ladders 500 units/year workshop cabinets 30,000 m <sup>2</sup> /year
Khadiri Company .....	Tehran	1961	Lighting fixtures
Jasm Company .....	Ahvaz	N.A.	Hinges, building hardware
Lord Manufacturing Co. ....	Tehran	1967	Signs and lighting fixtures
Malleable Iran .....	Tehran	1970	Malleable pipe fittings 11 tons/day
Mehrpa Company .....	N.A.	N.A.	Locks, padlocks, 1,000 tons/days
Metal World Factory .....	Tehran	N.A.	Steel profiles, galvanized pipes
Namati Company .....	Tehran	N.A.	Locks, hinges, building hardware
Ostad Industrial Company .....	Tehran	1968	Metal office furniture, safes, metal shelves, steel structures
Pama Co. ....	Tehran	N.A.	Cast iron, sanitary ware
Pars-America Industrial Co. ....	N.A.	N.A.	Aluminum profiles 100 tons/year
Pars Factories Company .....	Tehran	N.A.	Nails
Pars Lustre Co. ....	Tehran	1966	Lighting fixtures
Pars Metal Co. ....	Tehran	1965	Cast pipes and fittings, cast sewer pipes, enameled cast iron, sanitary wares
Pars Pipe and Profile Co. ....	Tehran	1967	Metal profiles for doors and windows, 13 to 20 millimeters seamed pipe
Paysaz Company .....	Ahvaz	1967	Cylindrical tanks, pressure tanks, 6,000 tons/year
Pour Azimi and Partners .....	Tehran	N.A.	Hinges, building hardware hinges



**Table 9.—Iran: Representative Metal Products Manufacturers—Continued**

Company	Location	Date Established	Products
Reza Union Company .....	Qazvin	N.A.	Locks, 200 tons/year
Saravel Industrial Company .....	Tehran	1965	Air-conditioning equipment, room air-conditioners 100 units/year, liquid chillers, both centrifugal and absorption 100 units/year, fan coils, 20,000 units/year, cooling towers 500 units/year
Semi-light Profile Co. ....	Tehran	1967	Seamed pipes, light profiles for doors and windows
Sepafie Company .....	Esfahan	1972	Steel profiles, pipes, 25,000 tons/year
Shahriar Nut and Bolt Co. ....	Tehran	1970	Steel and brass nuts and bolts, 7 tons/day capacity
Shemirani Industrial Factory .....	Tehran	1966	Indoor and outdoor lighting fixtures
Shid Industrial Company .....	Tehran	1960	Iron, copper, brass and aluminum rivets, 10 tons/year
Shiraz Profile Company .....	Shiraz	1970	Steel profiles
Shofazh Kar Co. ....	Tehran	N.A.	Heating equipment, enameled cast iron sanitary wares
Sho'leh Car Co. ....	Tehran	1966	Lighting fixtures
Stars Manufacturing Co. ....	Tehran	1964	Stainless and brass tableware
Tahvieh Company .....	Tehran	1965	Fan coils, freezers, ice makers, water coolers
Tick-Tack Company .....	Qazvin	1967	Nails, 3,000 tons/year, rods 1,400 tons/year
Zagross Company .....	Tehran	1962	Fan coils, 10,000 units/year, cooling towers 65 units/year, cold storage towers
Zarnegar Co. ....	Tehran	1970	Stainless steel flatware

Source: Trade interviews.

cast-iron fittings with a capacity of 11 tons per day in 1976.

In 1977 there were a number of Iranian producers of builders' hardware. Three companies specialized in the production of locks and padlocks. Four other companies produced a wide range of hinges, handles, locks, and other types of builders' hardware. One firm, Electro Danube Co., produced conduits for electrical installations.

Lighting fixtures made from brass, copper, stainless steel and other metals were also produced in a number of small workshops. There were also five large firms in Tehran which produced both indoor and outdoor lighting fixtures.

Metal office furniture, shelves, and hospital furniture were produced by approximately 10 large firms in 1977. Iran Metal Industries Company, a subsidiary of the Industrial Development and Renovation Organization, was among the larger firms. The Kaveh Group of Industrial Factories, in addition to manufacturing office furniture, was the main producer of safes, with an annual capacity of 40,000 safes and 500 safe doors. The Kaveh Group also produced ladders, workshop cabinets, and other metal products.

There were six industrial producers of fasteners in Iran in 1977, the largest of which was the Shahriar Nut and Bolt Company which had a capacity of 7 tons/day. There were also a number of smaller firms that produced brass and copper couplings using automatic machines.

## TRENDS, PROGRAMS AND PROJECTS

During the Fourth National Development Plan (1968/69–1972/73) Iran began to increase investments in both the primary metals industry and the metals products industries. During the Plan period, \$776 million was allocated for the development of the three major metal products industries: The mechanical engineering industry (manufacture of machine tools, industrial machinery and equipment, and steel structures), the electrical and electronic engineering industry (electrically operated machinery and equipment, including consumer durables), and the automotive industry. According to statistics of the Ministry of Economy, the annual average growth in production during the period of the Fourth Plan was: Metal products—16.1%; electrical machinery—23.5%; and transportation vehicles—31.5%.

Capital expenditures for the development of these same industries during the period of the Fifth National Development Plan (1973/74–1977/78) was set at \$1.5 billion. The Fifth Plan specifies investments in the mechanical engineering industry at \$534 million, the electrical and electronic engineering industry at \$519 million, and the automotive industry at \$542 million.

The Government has several major development projects within the metal products industries. One of the most ambitious projects will be developed by a joint venture between Krupp Huettenwerke AG. of West Germany and The Industrial Development and

Renovation Organization (IDRO). The plan for this project is to develop a major industrial complex called the Reza Pahlavi Industrial Estate in the new town of Shahreza near Esfahan. The plan includes a 24,000 hectare industrial site and 5,000 hectares for housing. Plans for the industries to be located at this site were still tentative in 1976, but are expected to include the manufacture of gas and fuel-powered turbines, wheels for locomotives, and welding machines. In all, there will be 15 different steel products manufacturing projects. The investment required for the project has been estimated at \$3.5 billion, and government planners estimate that the project will be completed in 1990.

A second heavy industry complex is being planned by IDRO for Khorasan province to be called the Esfarayen Industrial Complex. This project will produce 200,000 tons of cast-iron products, 1,000,000 tons of forged steel, and 150,000 tons of industrial and general machines annually. The planning for the project is being handled by the Asrayen Industrial Foundation. According to the plan, all machinery and equipment will be supplied by the U.S.S.R. under a barter arrangement for deliveries of Iranian natural gas.

Major expansions are planned for the Tabriz Machine Tool Company and the Arak Machine Manufacturing Company. Annual capacity of Tabriz is to be raised from 8,000 tons to 30,000 tons. Arak has plans to raise its annual capacity from 30,000 tons to 75,000 tons. Plant management hopes to rationalize production methods and shift to at least semi-automatic production line techniques for manufacturing many of the products which are characterized by medium-sized runs, such as industrial boilers, pressure tanks, cranes, mine jacks, and railroad car wheels. A number of agreements with foreign manufacturers had been reached by 1976 to implement these plans.

The products produced by Tabriz and Arak during the late 60's and early 70's were almost all of East European or Soviet design. Production agreements signed for manufacture of new products have been mostly with Western European and U.S. firms.

IDRO also has tentative plans to develop additional machinery manufacturing facilities in Ahvaz, in conjunction with the 600 Group of the United Kingdom. This project will reportedly produce lathes and sheet metal working equipment for which an agreement has been reached with Colchester Ltd. of the United Kingdom.

The Fifth National Development Plan sets the objective of raising the domestically produced portion of automotive components in vehicle production to 75% by March 1978. Iran National Industrial Manufacturing Company has been the industry leader in developing domestic fabrication of auto-

motive components. In 1974, Iran National started operation of a foundry to produce engines. The annual capacity of the foundry will be raised from 300,000 engines in 1976 to 500,000 engines in 1979. Iran National has also invested in an automotive components plant in Mashhad, the Reza Manufacturing Company, to produce bumpers, wheels, hub-caps, and eventually other components. Iran National plans to invest \$557 million between 1976 and 1980 in the effort to make itself independent of foreign suppliers. It plans additionally to raise production of automobiles from 75,000 in 1975 to 400,000 by 1980.

General Motors, Iran (GMI) plans to change the automobile models it produces in Iran. In 1977, it will drop the Opel cars it had been producing since 1974 and introduce smaller sizes of the U.S.-designed Chevrolet, Buick, and Cadillac. GMI's production of automobiles should increase from 10,000 in 1976 to 15,000 by 1980. In addition, GMI plans to begin production of trucks, possibly tandem axle types up to 26 tons, single axle types up to 19 tons and pickup trucks.

Other projects which were planned for implementation during the period of the Fifth Plan were an expansion of Khavar Manufacturing Company's assembly of heavy Mercedes-Benz trucks from 5,500 to 7,500 units per year, a project by Tizrow Manufacturing Co. to produce 36,000 Honda 90 cc. to 125 cc. motorcycles in Qazvin, and another project for the production of 1,000,000 pistons per year by the Iran Piston Company, a private project in joint venture with Mahler GmbH of West Germany.

Massey-Ferguson and John Deere, which have production agreements for tractors in joint partnership with Iranian investors, plan to expand capacity during the 1976-80 period. The ownership of Masiran is Massey-Ferguson 40%, Iran Tractor Manufacturing Co. (an IDRO subsidiary) 40%, IMDBI 11% and The Agricultural Development Bank of Iran (ADBI) 9%.

The Fifth National Development Plan also calls for rapid expansion of Iran's shipbuilding capability. To implement this, the Persian Gulf Shipbuilding Corporation was formed in 1975 and plans to develop a shipyard capable of repairing ships up to 500,000 d.w.t., and building ships up to 20,000 d.w.t. The project will include six workshops (fabrication, machinery, carpentry, pipe-making plant, electrical, and maintenance) plus its own power station, desalination plant, oxygen plant, acetylene plant, and compressed-air plant. The annual capacity is planned for repair of 100 ships of an average 200,000 d.w.t., construction of 6 vessels of 20,000 tons each, and the production of other unspecified marine equipment (see the chapter on Transportation).



A large number of new projects in metals products manufacture include licensing agreements with foreign firms. During the mid-1970's, an increasing percentage of government joint ventures and licensing agreements have been concluded with European, U.S., and Japanese firms. This trend is expected to continue past 1980 and there will be excellent opportunities in Iran to participate in development of the domestic industry either through licensing agreements or joint ventures.

## GROWTH PROSPECTS

The metal products manufacturing industry is expected to continue its growth during the 1976 to 1980 period. Demand for all types of metal products rose at close to 40% per year from 1974 to 1976 and is projected to continue its growth, although at a more modest average rate of about 25% per year. Although the domestic manufacturing industry grew above Fifth Plan goals during the 1973-75 period, its growth is expected to slow to about 20% annually through 1980 and the average annual rates over the entire Plan period will closely approximate those targeted.

**The Automotive Industry.**—The value added in the automotive industry, which grew at an average annual rate of 32% during the period 1973 to 1975, is projected to grow at 20% during the 1976 to 1980 period. It will reach about \$1.9 billion in 1980, exceeding the Fifth National Development Plan target of 20% per annum. The industry is projected to grow both in terms of the total number of units assembled, as well as in terms of domestic manufacture of parts and accessories. Iran National plans to reach 75% in value of domestic content by 1978, and all other vehicle producers also have programs to raise the value of domestic content.

**Electrical Engineering Industry.**—The Fifth National Development Plan targeted the average annual growth of value added in the electrical engineering industry at 19%, and actual average annual growth over the period is expected to be just under that figure. Increased discretionary income and changing lifestyles have brought about an accelerated growth in retail sales of consumer durables, estimated at 25% annually during the 1973 to 1975 period. The largest market has been for refrigerators. Production of gas ranges and washing machines, which had a smaller market in the mid-1970's, is expected to increase during the 1976 to 1980 period and beyond.

The domestic industry has not been able to meet the total demand for consumer durables. Despite much higher prices on imported products, a large segment of the middle and upper income population

shows a strong preference for imported home appliances, especially for larger products and products with special features which are not manufactured domestically.

**Mechanical Engineering Industry.**—Value added in the mechanical engineering industry grew at an average annual rate of close to 50% during the 1973 to 1975 period. The Fifth National Development Plan set a growth goal of 38% annually; actual annual growth is expected to be 34% over the 5-year period while value added is projected to reach \$2.7 million in 1980. The fastest growing segment of the industry is estimated to be the manufacture of structural steel products which is expected to grow at about 30% annually. Most of this growth will result from greater use of prefabricated steel products in construction and the high overall growth of the construction industry. Growth in production of industrial equipment and machinery is estimated to be slower, averaging about 20% annually during the 1966-80 period.

## CAPITAL GOODS MARKET

Total Iranian sales of equipment for primary metals and metal products production in 1975 were \$264 million (see table 10). Sales of capital equipment to the metallurgical and metalworking industries grew rapidly during the 1973-75 period, rising from \$93 million in 1973 to \$264 million in 1975. The market is expected to grow at an average rate of nearly 25% annually during the 1976 to 1980 period, reaching \$650 million in 1980. Most of this equipment will be purchased for use in large government projects, particularly for steel, aluminum, and copper production. In 1975 the growing domestic machine-building industry accounted for about 25% of sales, primarily machine tools, and domestic manufacturers are expected to continue to supply about one-quarter of these requirements through 1980.

Sales of metallurgical and primary metals production equipment experienced particularly rapid growth, rising from \$24 million in 1973 to \$100 million in 1975. This growth was due primarily to the equipping of large government-financed projects for primary metals production. Sales of this equipment are expected to reach \$266 million in 1980. In 1975 sales of machine tools and equipment for metal products fabrication including powered hand tools amounted to almost twice the 1974 sales of \$77.8 million. They are expected to rise to \$290 million by 1980, a 17% average annual growth rate during the 1976-80 period. The domestic production of machine tools, valued at \$52.9 million in 1975, is expected to grow at an annual rate of 20%

**Table 10.—Iran: Size of The Market for Metallurgical and Metalworking Equipment**  
(in thousands of U.S. dollars)

	1973	1974	1975	(estimated) 1976	1980
<b>METALLURGICAL AND PRIMARY METALS</b>					
<b>PRODUCTION EQUIPMENT</b>					
Domestic Production .....	8,388	9,769	13,225	15,000	26,000
Imports .....					
United States .....	3,152	1,397	25,365	31,500	72,000
Fed. Rep. of Germany .....	7,987	19,881	33,780	—	—
Italy .....	391	246	4,220	—	—
Japan .....	241	2,184	4,518	—	—
Others .....	4,062	4,436	19,068	—	—
Total .....	15,833	28,144	86,951	105,000	240,000
Exports .....	—	—	—	—	—
Total Market .....	24,221	37,913	100,176	120,000	260,000
<b>MACHINE TOOLS AND EQUIPMENT FOR METAL</b>					
<b>PRODUCTS FABRICATION</b>					
Domestic Production .....	33,534	39,077	52,903	63,000	130,000
Imports .....					
United States .....	2,230	3,466	10,320	13,500	24,000
Fed. Rep. of Germany .....	9,950	13,497	27,997	—	—
United Kingdom .....	2,023	2,790	5,947	—	—
Eastern European Countries .....	6,103	8,849	11,107	—	—
Others .....	9,027	10,140	21,902	—	—
Total .....	29,333	38,742	77,273	90,000	160,000
Exports .....	—	—	—	—	—
Total Market .....	62,867	77,819	130,176	153,000	290,000
<b>WELDING EQUIPMENT</b>					
Domestic Production .....	—	—	—	—	10,000
Imports .....					
United States .....	1,573	1,569	7,517	9,000	17,000
Fed. Rep. of Germany .....	1,364	1,867	8,308	—	—
United Kingdom .....	744	693	3,069	—	—
Switzerland .....	474	1,737	2,385	—	—
France .....	45	369	2,417	—	—
Others .....	1,291	1,536	7,685	—	—
Total .....	5,491	7,771	31,381	38,000	74,000
Exports .....	—	—	—	—	—
Total Market .....	5,491	7,771	31,381	38,000	84,000
<b>CONTROL AND MEASURING INSTRUMENTS FOR</b>					
<b>METALLURGY, METALWORKING, AND MACHINING</b>					
Domestic Production .....	—	—	—	—	—
Imports .....					
United States .....	162	349	644	1,400	2,800
Fed. Rep. of Germany .....	128	122	365	—	—
United Kingdom .....	119	310	497	—	—
France .....	72	97	289	—	—
Canada .....	298	96	87	—	—
Others .....	132	186	309	—	—
Total .....	911	1,160	2,191	5,000	10,000
Exports .....	—	—	—	—	—
Total Market .....	911	1,160	2,191	5,000	10,000
<b>TOTAL MARKET SIZE</b>					
Domestic Production .....	41,922	48,846	66,128	78,000	166,000
Imports .....					
United States .....	7,117	6,781	43,846	55,400	115,800
Fed. Rep. of Germany .....	19,429	35,367	70,450	—	—
United Kingdom .....	2,886	3,793	9,513	—	—
Others .....	22,136	29,876	73,987	—	—
Total .....	51,568	75,817	197,796	238,000	484,000
Exports .....	—	—	—	—	—
Total Market .....	93,490	124,663	263,924	316,000	650,000

Source: United Nations, Organization for Economic Cooperation and Development, supplier country, and official Iranian trade statistics, estimates based on trade interviews.



per year through 1980. Sales of welding equipment were \$31.4 million in 1975, almost four times the 1974 level of \$7.8 million. The market for welding equipment should grow at an average rate of 22% per year during the 1976-80 period, reaching a total of \$84 million in 1980. There was no domestic fabrication of welding equipment in Iran in 1975. The market for metals industry control and measuring instruments has remained relatively small, amounting to \$2.3 million in 1975, approximately twice the 1974 level of \$1.2 million. The large government and private metals industry development projects will require more advanced machine tools and production control instruments. Sales of control and measuring instruments in 1976 were estimated at approximately \$5 million.

## **Imports**

Imports of metallurgical and metalworking equipment in 1975 amounted to \$197.8 million. West German suppliers have traditionally held the dominant position in the market and accounted for over one-third of all sales of imported capital equipment during the 1973-75 period. Sales of U.S. supplier firms increased rapidly during the same period, rising from \$7 million in 1973 to \$43.8 million in 1975, \$23.7 million of which was rolling mill equipment supplied to the Alum Pars project. U.S. firms are expected to maintain their 22% market share through 1980. United Kingdom suppliers sold about 5% of the imports during the 1973-75 period, \$5.9 million of which were sales of machine tools and equipment for metals products fabrication. United Kingdom suppliers provided approximately 10% of Iran's welding equipment imports in 1975, amounting to \$31.5 million. Suppliers from West Germany are particularly strong in sales of machine tools and equipment for metal products fabrication, and have consistently supplied about 40% of these Iranian imports.

## **Domestic Manufacturing**

Domestic suppliers of metallurgical and metalworking equipment made total sales amounting to \$66.1 million in 1975. Most of these sales were of machine tools and equipment for metal products fabrication, which amounted to \$52.9 million in 1975. Domestic supply of metallurgy and primary metals production equipment was more limited, valued at \$13.2 million in 1975. There were nine large manufacturers of machine tools in Iran in 1976, but two firms produced over half the value of total domestic supply. In addition to the nine large producers, there were numerous small job

shops that produced some machine tools on an irregular basis.

Arak Machine Manufacturing Company produces metallurgical equipment. The Tehran Machine Production Company produces rolling mill equipment for small domestic producers of copper sheet made from scrap copper. There are no other important producers of primary metals production equipment.

A number of Iranian manufacturers produce basic machine tools, and since high tariffs are placed on similar imported equipment, domestic manufacturers supply about 80% of the specific types of equipment produced domestically. Domestic production includes hydraulic and mechanical presses, shears, punching machines, lathes, radial drills, grinding machines, milling machines, and shaping machines (see Machine Tools and Industrial Equipment chapter).

## **MARKET OPPORTUNITIES**

The metallurgical and metalworking industries in Iran are expected to experience rapid growth and offer excellent opportunities for the sale of machinery and equipment.

During the 1976 to 1983 period the Government of Iran plans to implement sizeable projects for copper refining, steel manufacture, and aluminum refining. All steel manufacturing facilities, with the exception of the Aryamehr Steel Plant expansion in Esfahan, will use the direct reduction method. The planned expansion of steel production capacity from 600,000 tons in 1975 to 15 million tons in 1983 will require enormous investments for capital equipment, and will also offer excellent opportunities for engineering consulting firms. The increased availability of domestically produced steel will also act as a catalyst for growth of rolling mills, production of specialized steels and foundry works. Iran's domestic manufacturing of equipment for primary metals production will grow, but the majority of equipment needs will continue to be imported.

Domestic manufacturing will continue to supply most of the basic machine tools purchased in the country, and protection of domestic suppliers by means of import bans and high tariffs is expected to continue. The greatest opportunities for foreign suppliers are in sales of specialized machine tools, numerically controlled equipment, high capacity and precision machine tools.

There will be opportunities for sales of large hydraulic and mechanical presses with greater than 1,000 ton capacity. Most of these presses will be purchased by firms in the rapidly expanding structural steel, automotive, automotive accessories, and aircraft industries. There will continue to be a

market for large lathes with more than 4 meters capacity.

The limited supply of skilled labor and higher demand for metal products will cause manufacturing firms to seek ways to increase productivity and result in increased sales of numerically controlled machines, as well as other types of automatic and semiautomatic production machinery. There will be excellent opportunities for the sale of automatic presses, punching machines, profile forming machines, cutting and welding machinery.

Domestic manufacturers of metals products, such as consumer durables, machine tools, automobiles, and parts and accessories for the automotive industry, usually manufacture under license or through joint ventures with foreign firms. It is expected that there will continue to be excellent opportunities for foreign firms to make such arrangements during the 1976 to 1980 period.

## MARKETING ENVIRONMENT

### Buyers' Universe

There are seven large purchasers of primary metals production equipment, approximately 60 large purchasers of machine tools and other metal products manufacturing equipment and an estimated 30,000 to 40,000 workshops and manufacturing firms that make occasional purchases of machine tools (see table 11).

The number of purchasers of primary metals proc-

*Table 11.—Iran: Major Purchasers of Metallurgical and Primary Metals Equipment*

---

Alum Pars Company 116 Mirdamad Ave. Tehran, Iran
Industrial Development and Renovation Organization Jam-e Jam St. and Pahlavi Ave. Tehran, Iran
Iran Aluminum Company 56 Takht-e Jamshid Ave. Tehran, Iran
Iran National Copper Industry Company Valiahd Square 5 Elizabeth II Boulevard Tehran, Iran
National Iranian Steel Company Kakh Square Ettehad St. Tehran, Iran
National Iranian Steel Industries Corporation Shah Abbas Crossing 261 Takht-e Tavoos Ave. Tehran, Iran
Shahriar Industrial Group 578 Hafez Ave. Tehran, Iran
Military Industrial Organization Saltanatabad Ave. Tehran, Iran

---

essing equipment in Iran is limited since the majority of large metals processing projects are state-owned. The largest purchaser during the 1976 to 1980 period will be the National Iranian Steel Industries Corporation (NISIC). NISIC issues tenders for purchase of equipment through the Industrial Development and Renovation Organization (IDRO). Another purchaser, the National Iranian Steel Company, obtains most of its equipment under government-to-government agreement with the Soviet Union. Iran National Copper Industry Co. and the Arak Aluminum Company also purchase equipment through IDRO.

There were 590 large industrial firms with more than 100 workers in 1976, but only about 60 of these companies have significant annual requirements of metallurgical equipment or machine tools. Many other companies in Iran have occasional requirements of machine tools to equip new facilities and have some replacement requirements.

The largest single purchaser of machine tools in Iran is the Military Industrial Organization (MIO). It operates numerous heavy industries producing armaments, military hardware, electronics, steel and brass products, containers, and structural steel materials. In 1976, the MIO was developing large industrial projects with a number of foreign specialist firms. The MIO normally purchases capital equipment through use of international tenders, although some of the larger industrial organizations within MIO such as Iran Aircraft Industries, Iran Electronics Industries and Bell Helicopter—Iran often purchase from the local market or directly from foreign suppliers. The second largest purchaser of machine tools is the government investment and holding company, Industrial Development and Renovation Organization (IDRO). IDRO owns a number of heavy industrial companies that have large requirements of machine tools. While individual companies within the IDRO group may purchase equipment directly, IDRO often reviews such purchases and has set up a separate company, PADECO, which acts as a central purchaser and warehouse for IDRO companies. IDRO also has formed a company called the Metallurgical Research Center which plays an important technical consulting role for IDRO subsidiaries in the metallurgical and metals products industries. Iran National Industrial Manufacturing Company, the vehicle producer, is the largest individual manufacturing unit in the country.

In addition to the major buyers of machine tools, there are 30,000 to 40,000 small workshops in Iran which purchase some machine tools. These small workshops normally buy from suppliers who have representation in Iran, and about 90% of these purchases are made primarily on a price basis.

Consulting firms play a very important role in the

Source: Trade interviews.



selection of equipment for primary metal production projects. While NISIC, the National Iranian Copper Company and IDRO are the actual buyers, the consulting firms set the design and specifications of the equipment and have a strong influence on the choice of suppliers.

### **Foreign Suppliers' Universe**

There is a wide array of foreign-supplied equipment for the metallurgical and metalworking industries in Iran. A large number of European and Eastern European supplier companies are actively represented in the Iranian market, many through local distributors, some by embassy trade representations, and several by their own subsidiary sales and service offices in the capital city. West German and East European suppliers have been well established in the market much longer than those from other countries. Until the early 1970's, West German and East European suppliers sold over 80% of Iran's metallurgical and metalworking equipment imports. East European countries have been particularly successful in sales to the primary metals and metallurgical industries. The Aryamehr Steel Plant in Esfahan was almost completely equipped by Eastern European and Soviet suppliers as a result of barter agreements. West German suppliers have also traditionally sold a considerable portion of Iran's needs for metallurgical and primary metals production equipment. Most of the equipment in the nine Shahriar Industrial Group plants is West German in origin.

Iran is gaining the technology needed for its new projects in the primary metals industry through contracts with a number of foreign firms. United States companies have played the major role in the development of the Ahvaz steel complex. Direct reduction processes to be used in the complex are being supplied by Swindell-Dressler Corp. of the United States, Korf-Midland-Ross Holding AG. of West Germany in which Midland-Ross Corp. (U.S.) has part ownership, and Thyssen Rohrenwerke AG. of West Germany. The consulting engineers for the plant construction at Ahvaz are Kaiser Engineers Ltd. of the United Kingdom, a subsidiary of Kaiser Industries Corp. (U.S.) and Tadbir Saanat, an Iranian consulting firm. Tadbir Saanat, a joint venture firm between IMDBI and G. Megardoonian and Associates, a leading Iranian consulting engineering firm, also has the consulting contract for the civil construction works. The construction contractor for the project is a joint venture firm comprised of Foster Wheeler Corp. of the United States and Tehran Jonub Construction Company of Iran.

Other foreign consulting firms have won contracts for additional direct reduction mill projects; British Steel Corporation of the United Kingdom for the Esfahan mill project, and Italimpianti in joint

venture with NISIC and IMDBI for the mill in Bandar Abbas.

**Metallurgical and Primary Metals Production Equipment.**—Supplier firms from West Germany have traditionally been the chief suppliers of metallurgical and primary metals production equipment to Iran. They also supply almost all associated electrical and control systems. U.S.S.R. and Eastern European suppliers, due to their important role in the development of the steel industry, particularly the development of Aryamehr steel plant in Esfahan by the Soviet Union, also have sold large amounts of steel mill equipment in Iran. The most successful supplier of equipment for smelting and rolling operations has been Demag AG. of West Germany. Shahriar Industrial Group has had nine plants almost completely supplied by Demag and to a lesser extent by Con-Cast S.A. of Switzerland. Rolling mill equipment has been supplied by Schloemann-Siemag and Kirckfeld GmbH and Siemens AG. all of West Germany. Sofein AG. of West Germany has been an important supplier of industrial furnaces in Iran. The storing and handling equipment for the Ahvaz steel mill was supplied by Sofreside S.A. of France.

In 1975 and 1976, United States suppliers made increasing sales of equipment to the primary metals industry, particularly to the large new government steel mill projects and to the aluminum industry. Lectromelt Corp. of the United States is supplying the furnace and ovens for the new Ahvaz steel plant. Philip A. Hunt Chemical Corp. of the United States is supplying the cold rolling mill equipment for the new Alum Pars Company factory, all of the machinery for which has been ordered through the Techmo-Hunter International Co. of Italy.

**Machine Tools and Equipment for Metals Products Fabrication.**—There are numerous foreign suppliers of machine tools and other equipment for metals products fabrication selling in Iran. West German suppliers are the most numerous and successful in sales of almost all categories of machine tools. United States suppliers, many of whom were unknown in Iran until recently, increased their sales considerably in 1975 and are expected to continue selling well in the future. Many suppliers from Eastern Europe still supply basic machine tools such as presses, drills, and lathes.

Dye casting machinery for metal products is supplied by a number of foreign firms, the most common being Dilinger Stahlbau Bov and Krauss-Maffei AG. of West Germany.

Lathes are mainly supplied by domestic producers, although all lathes over 5 meters and some specialized lathe equipment are imported. The most common foreign-supplied lathes are Russian, Czechoslovakian, and Polish. Some U.S. lathes sup-

plied by Smith International Inc. and The Lodge and Shipley Co. are also used in Iran.

Most of the small- and medium-sized presses purchased in Iran are supplied by domestic producers. West German suppliers are the most successful foreign suppliers of large brake presses, punch presses, shears, and hydraulic presses. Presses supplied by Fritz Muller Pressenfabrik and Schuler GmbH. are the most common foreign supplied presses. Other West German suppliers of presses which have sold equipment in Iran are Jung GmbH., Deckel A.G., Weingarten AG., Wilhelmsberger GmbH. and G. Siempelkamp & Co. Some U.S. presses are also in use, such as those supplied by Precision Cincinnati, Inc.

Grinding machines are supplied both by domestic producers and a large variety of foreign manufacturers. Eastern European countries account for the largest sales of grinding equipment. There are no clear market leaders among Western European suppliers. Some grinding machines in common use are ELB-Schliff and Blohm & Voss AG. of West Germany, and Fontano Carlo Products of Italy. West German suppliers and Technoexport of Czechoslovakia supply most of the market for cylindrical grinders.

There is limited use of programmed and automatic machine tools in Iran, although their use is becoming more common. Numerically controlled P.F. Peddinghaus punch machines, automatic screw machines by Traub AG., electronic eye-controlled gas cutting machines supplied by Messer Griesheim GmbH., all of West Germany, are used in Iran. Some automatic screw machines have been sold by Brown and Sharpe Manufacturing Co. of the United States.

Other types of equipment that have been sold in Iran are chucking machines by Churchill (U.K.), welding equipment by Cifes of Italy and The Lincoln Electric Co. of the United States, ovens, furnaces, shotblast machines, and materials handling control systems by Alfred Gutman Ges. fuer Maschinenbau Volkerstr. of West Germany.

There are a number of foreign suppliers of small powered hand tools such as drills, grinders, etc. The most common suppliers are A.E.G., Bosch GmbH and August Suhner and Fein of West Germany; Skil Corp., Ingersoll-Rand Co., Rockwell International Corp., and the Black & Decker Manufacturing Co. of the United States.

A relatively new marketing approach in Iran is represented by several sales consortia, export management firms, and associations which established themselves in Iran during the 1974-76 period. Do-All Iran Company, Iranian subsidiary of the U.S. export management firm DoAll Company, was established in 1974. It represents U.S. firms which supply a wide range of tools and dies, machine tools

and metallurgical and primary metals production equipment, including: The DoAll Company, E.W. Bliss Co. (a division of Gulf Western Company) Federal Products Corp. (an Esterline company), Strippit Div. (a division of Houdaille Industries), Elox Div. (a division of Colt Industries), Giddings and Lewis, Inc., Hammond Machinery Builders, Inc., Mattison Machine Works, Monarch Machine Tool Co., Moore Special Tool Co., Inc. and National Acme, (a division of Acme-Cleveland Company).

The American Machine Tool Consortium (AMT) began its sales effort in Iran in early 1976; the member companies are Brown & Sharp Manufacturing Co., Devlieg Machine Company, Kingsbury Machine Tool Corp., Landis Tool Company, LeBlond, Inc., Motch Merryweather/Cone-Blanchard, National Automatic Tool Co., Setco Industries Inc., The Hill Acme Company, V & O Press Company, Verson Allsteel Press Co. and Wells-Index Corp. AMT offers a wide range of machine tools and can supply individual machines, turnkey plants or almost any combination of machine tools required by the purchasers.

A third sales consortium of U.S. machine tool builders is U.S. International Inc., which entered the Iranian market in May 1976. Members of this group are Barber-Coleman Company, Danly Machine Corp., Lucas Machine Division of New Britain Machine Company, The Warner Swasey Co. (Turning Machine Div. and Weideman Div.), and the Yoder Company.

The Herbert Co. (U.K.) represents several British machine tool manufacturers, while associations of Japanese manufacturers and manufacturers from several European countries are also active in promoting machine tool sales.

## Marketing Factors

Machinery and equipment for the production of primary metals is usually purchased directly from the supplier's home office. However, there are a number of European suppliers of metallurgical and metal products equipment in Iran that have subsidiary sales and service firms or maintain branch offices in Tehran. Still others supply through local distributors or agents. Large suppliers, such as Demag of West Germany, have Iranian representatives who handle consulting, sales, and service, and are considered highly reliable by the users of their equipment.

In an attempt to overcome the marketing advantages of long-established firms in Iran, many foreign suppliers just entering the market have associated in a number of ways to help in increasing sales by providing more effective promotion and assuring buyers that after-sales service will be readily avail-



able. These consortia and associations of suppliers can better afford to maintain sales and service personnel in Iran. They compete more successfully with suppliers which have higher levels of sales and have been established longer in the market.

In order to take advantage of protective tariffs, a number of foreign firms have decided to produce or license the production of machine tools in Iran rather than export.

There are several opportunities for suppliers to sell equipment to the many new industrial firms being established in Iran. A number of these firms are using foreign technology which was not previously available in the country. These newly established firms are often more willing to consider purchase of

Price is a very important factor in purchase decisions, since most small buyers of machine tools make purchases primarily based on price considerations. Machine tools supplied from Eastern European countries and those produced domestically are considered by nearly all users to be inferior in quality, but because they are less expensive, their sales remain high.

Imports of metallurgical equipment and machine tools must receive approval from the Ministry of Industry and Mines. Only in exceptional cases will the Ministry give permission to import machinery which is similar to that produced domestically. The criteria applied by the Ministry are normally based on the end product to be produced; if the product can be made by locally manufactured machines, permission will not be granted. Metallurgical machines such as converters, machines for casting, moulds, rolling mill equipment and all types of machine tools are assessed customs duties of 10% C&F and a Commercial Benefit Tax of 5% (ad valorem).

## **COMPETITIVE POSITION OF U.S. SUPPLIERS**

There are approximately 30 U.S. suppliers of metallurgy and metalworking equipment actively represented in Iran, and many more who have supplied equipment during recent years.

The price of almost all types of U.S. metallurgical equipment and machine tools is generally higher than comparable items supplied from other countries, and U.S. firms have not been able to compete well in supply of basic machine tools. However, the market share supplied by U.S. manufacturers has

risen in the past few years. There are several reasons for this rise. Many new industries in Iran have specialized requirements that are best met by U.S. manufactured equipment. In addition, many of Iran's new industries have been developed using U.S. technology, and the designers or consultants of the projects often specify U.S. equipment. This has been especially true for projects in the steel, copper, and aluminum industries.

A large number of U.S. suppliers have entered the Iranian market recently. To overcome the advantages enjoyed by well established European suppliers U.S. firms have often adopted aggressive sales and marketing strategies. A number of U.S. machine tool manufacturers have initiated their marketing efforts in Iran through experienced export management firms or through participating in sales consortia with permanent representation in the country.

A major portion of U.S. equipment is supplied directly from American manufacturing plants. However, many U.S.-based multinational firms have entered the Iranian metalworking equipment market through European subsidiaries, both to supply equipment and to license technology. The Lincoln Electric Co. (U.S.) supplies welding equipment from the U.S. and also from its foreign subsidiaries, including The Lincoln Electric Co. Australia Pty. Ltd., and The Lincoln Electric Co. of Canada Ltd. Black & Decker supplies from its U.K. manufacturing subsidiary, Black & Decker Ltd., while Cincinnati Milacron Inc. also markets through its British affiliate, Cincinnati Milacron Ltd. Exxon and Midland-Ross have licensed direct reduction technology through their German subsidiaries.

There are several important advantages which U.S. suppliers have in the Iranian market. In the field of primary metals production, Iran has turned towards U.S. technology in the three primary areas of development: steel, copper, and aluminum. In supply of machine tools, welding equipment, and control and measuring instruments, U.S. equipment has had a good reputation for precision, high productivity, and reliability, but few U.S. suppliers have actively marketed in Iran because they were previously unable to compete with lower priced imports from Western and Eastern Europe. However, during the mid-1970's more Iranian firms have purchased U.S. equipment and are willing to pay the extra cost for higher productivity. This trend should continue and U.S. suppliers are expected to experience growing sales.

# Mining, Petroleum, and Natural Gas Extraction

DEVELOPMENT OF Iran's natural resources has been given high priority by the Government in its efforts to develop a modern, industrialized economy. While Iran's petroleum resources have long been exploited and are the main source of income for Iranian development programs, its other mineral resources are only beginning to be tapped as sources of foreign exchange earnings as well as raw materials for domestic industries.

Intensive development of iron and coal reserves is underway to support the domestic steel industry which is being built. A \$1.4 billion project is underway to develop large copper deposits at Sarcheshmeh near Kerman, as the basis for an integrated copper industry complex including mines, ore processing, smelting as well as primary and secondary manufacturing of copper and copper products. Iran has long exported substantial quantities of chromite, lead, zinc, and some manganese, and increased priority has been given to the establishment of processing facilities to process these ores into concentrates, metals, and alloys. In addition, a comprehensive program has been initiated to survey the country's mineral resources, and traces of bauxite phosphates, uranium, and other ores had been identified as of

1976. The development of Iran's mining industry is requiring substantial investments in new equipment for ore extraction and processing. The market for such equipment is expected to amount to nearly \$200 million in 1980. U.S. firms have excellent opportunities to provide both technical services and equipment as Iran seeks to apply modern high capacity technology and equipment to the development of mining.

Capital investment in exploration, production, and refining of petroleum was estimated at \$1.5 billion in 1976, while revenues were estimated at \$19 billion and accounted for 83% of the Government's income. An estimated \$284 million was invested in natural gas development, while export earnings of some \$103 million were obtained from natural gas sales. High levels of investment are planned in the industry through 1980 for exploration, production, secondary recovery through gas injection, pipelines, and a wide range of other industry operations and facilities. By 1980 expenditures on equipment are projected to reach over \$920 million. U.S. firms are well established in the industry and have excellent opportunities to increase sales of equipment and services.

## Mining

### STRUCTURE AND SIZE

Iran boasts reserves of 1 billion tons of copper (including some of the world's richest ores) located in Kerman, Sistan, and Khorasan provinces, with smaller deposits in Azarbaijan (see table 1 and figure 1). Iran has substantial coal deposits located primarily in Kerman province and in the Alborz range in the north, estimated reserves range as high as several billion tons. The largest iron deposits being exploited are in the area of Bafq to the east of Yazd in central Iran, estimated at nearly 700 million tons; other large deposits are found in Kerman province and near Arak (about 250 kilometers southwest of Tehran). Chromite is found in exploitable deposits in Khorasan province in the northeast as well as in

the southwest near Bandar Abbas; total reserves are estimated at 7 million tons. Iran also has substantial deposits of lead and zinc, near Arak, Esfahan and Yazd. Reserves are estimated at 10 million tons.

Other mineral resources include manganese, gold and silver, antimony, uranium, bauxite, phosphates and sulphur as well as a wide range of other non-metallic and industrial minerals, including building stone, barite, kaolin, limestone, borates, sulfates and rock salt. Iran has some semiprecious stones, and is a leading producer of turquoise. Since most of the country has not been systematically surveyed, these mineral estimates are likely to represent only a small part of Iran's total mineral reserves.

In 1975, 560 mines were in operation (see table 2). This represents a decline from previous years



**Table 1.—Iran: Principal Mineral Reserves**  
(millions of tons)

Mineral	Reserves <sup>1</sup>
Copper	1,000.0
Iron Ore	1,000.0
Coal	1,000.0
Sulphur	12.0
Lead/Zinc	10.0
Chromite	7.0
Kaolin	7.0
Silicon & Quartz	3.5
Ferrous-Oxide	1.5
Manganese	.720
Refractory Sand	.520
Gold	.158
Antimony	.012

<sup>1</sup> Estimates of reserves, 1975.

Source: Geological Survey of Iran, trade estimates.

resulting from the elimination of marginal activities and the consolidation of iron, copper, and coal mining under government control. In 1975, 65,000 people were employed in the mining industry. Of this number, over 25% were working in government-operated coal mines. Value of the mines' output was valued at \$204 million in 1975 while production from quarries and the mining of building materials totaled \$265 million. Exports of mineral products was valued at \$24.2 million (see table 3); principle exports were lead, zinc, copper, and chromite.

**Copper.**—Copper production in 1975 was 17,000 tons of which only a small portion was exported. The majority of Iran's copper deposits are located



Source: Ministry of Industry and Mines.

**Table 2.—Iran: Mining Development**

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
TOTAL NUMBER OF MINING ESTABLISHMENTS .....	824	505	535	560	575	750
INDUSTRY EMPLOYMENT .....	20,586	38,304	46,000	65,000	75,000	100,000
CAPITAL EXPENDITURES						
Government .....	303.6	93.6	215.8	264.3	315.0	400.0
Private .....	211.2	7.1	28.4	50.5	41.0	50.0
	514.8	100.7	244.2	314.8	356.0	450.0
MINING PRODUCTION (thousands of tons)						
Coal .....	300	1,000	2,200	3,000	3,300	8,000
Lead .....	80	97	88	96	100	130
Zinc .....	85	95	57	70	75	90
Iron Ore .....	73	100	980	1,020	1,400	2,800
Copper .....	12	15	16	17	18	160
Chromite .....	160	180	156	210	215	250
Limestone .....	4,000	5,200	5,700	6,200	6,500	10,000
Turquoise .....	41	50	51	53	51	60
EXPORTS OF MINERAL ORES (millions of U.S. dollars) ....	11.5	19.7	29.4	24.2	26.7	174.0

<sup>1</sup> Estimates.

Source: Official Iranian Trade Statistics, estimates based on trade interviews.

**Table 3.—Iran: Annual Mineral Exports by Type**  
(thousands of tons/millions of U.S. dollars)

Mineral	1970		1973		1974		1975		1976 <sup>1</sup>		1980 <sup>1</sup>	
	Tonnage/Value		Tonnage/Value		Tonnage/Value		Tonnage/Value		Tonnage/Value		Tonnage/Value	
Copper .....	1	.20	1.0	.03	—	—	5	.22	7	.31	145	137.00
Lead .....	89	5.46	88.0	12.30	46.0	14.40	73	14.08	76	14.59	108	19.98
Chromite .....	222	3.22	151.0	1.10	149.0	3.10	89	2.70	97	2.91	135	4.05
Zinc .....	97	2.60	72.0	6.20	70.0	11.66	55	7.20	68	8.84	93	14.04
Coal .....	—	—	.3	.08	.6	.26	—	—	—	—	—	—

<sup>1</sup> Estimates.

Source: Official Iranian trade statistics, trade estimates.

in Kerman province. Numerous deposits and occurrences are found on a 350-kilometer line running through the mountainous area from the northwest to the southeast some 150 kilometers west of Kerman. Copper is mined in Azarbaijan and Gilan from several smaller deposits at Mazraeh (300,000 tons), Baychebagh (100,000 tons), and Chiezeh (200,000 tons) (see table 4). Other major copper mining regions include the Abbasabad area on the Khorasan-Semnan province border in the northeast, and the Anarak area northeast of Nain in Esfahan province.

A 200-million ton deposit of high-grade copper ore (3–4%) located at Qualeh Zari near Birjand in southern Khorasan Province is being mined by Minak Company, a Japanese-Iranian joint venture; Toho Zinc Company is the Japanese partner. This joint venture was established in 1973 before the Government's assumed responsibility for development of copper mining. It is the only private firm engaged in copper mining and refining. The underground mining complex, which also includes a concentrator, produces 3,000 tons annually of 30% copper concentrate, all of which is exported. Deposits totaling 60 million tons located at Chehel Kureh in the Zahedan area of Sistan Province in the southeast were also being explored by Minak in 1976.

The most significant development in copper mining has been the Government's decision to develop the Sarcheshmeh copper mine and complex, approximately 160 kilometers west of Kerman. The copper deposit, of the porphyry type, is oval shaped and covers over 2.7 square kilometers. Drilling to 200-meter depth confirmed reserves of 440 million tons of 1.2% average copper ore; while drilling to 500 meters indicated that the total reserves may exceed twice that amount. A state-owned company, National Iranian Copper Industries Corp. (originally the Sarcheshmeh Copper Mining Company), was formed in 1972 to undertake a \$1.4 billion project to develop the deposits into an integrated operation to produce blister copper. In 1974, it concluded a technical service and consulting agreement with the Anaconda Company (U.S.). The project includes, in addition to mining, ore processing and smelting facilities, construction of a 3,000 residential unit community, water supply, electric power, roads, and other necessary facilities. The company has begun the removal of 42 million tons of overburden in order to begin mining by the open-pit method. When the mine becomes operational, over 30 million tons per year of rock will be mined, one-half of which will be copper ore.



**Table 4.—Iran: Principal Mineral Deposits, 1976**

Name and Location	Reserves (millions of tons)	Status
<b>COPPER</b>		
Sarcheshmeh (Kerman) .....	440.0	Under development
Qualeh Zari (Khorasan) .....	200.0	Operating
Chehel Kureh (Sistan) .....	60.0	Exploration
Meiduk (Kerman) .....	45.0	Slated for development —Fifth Plan
Chahr Gonabad (Kerman) .....	N.A.	Slated for development —Fifth Plan
Anarak Region (Esfahan) .....	N.A.	Undeveloped
Abbasabad Region (Semnan/ Khorasan) .....	N.A.	Some mining slated for development—Fifth Plan
Mazraeh (Azarbaijan) .....	.3	Operating
Chiezeh (Gilan) .....	.2	Operating
Baychebogh (Azarbaijan) .....	.1	Operating
<b>IRON</b>		
Goleghar (Kerman) .....	200.0	Under development
Choghart (Yazd) .....	170.0	Operating
Anomaly XI (Yazd) .....	150.0	Under development
Northern Anomaly (Yazd) .....	150.0	Under development
Chadar Malu (Yazd) .....	100.0	Under development
Tang-e Zagh (Bandar Abbas)		Slated for development —Fifth Plan
Shamsabad (Arak) .....	100.0	No plans for develop- ment announced
<b>COAL</b>		
Shahrud (Semnan) .....	150.0– 160.0	Operating
Pabdana (Kerman) .....	68.0	Operating
Darbidkun (Kerman) .....	50.0– 200.0	Under development
Khamrud (Kerman) .....	40.0	Under development
Sarapardeh (Kerman) .....	36.0	Under development
Badamu (Kerman) .....	20.0	Operating
Assadabad (Kerman) .....	15.0	Under development
<b>LEAD/ZINC</b>		
Mehdiabad (Yazd) .....	24.0	Operating
Kushk (Yazd) .....	10.0	Operating
Anguran (Azarbaijan) .....	6.0	Operating
Shankou (Esfahan) .....	6.0	Operating
Ahangaran (Malayer) .....	1.0	Operating

Source: Geological Survey of Iran, trade interviews.

The ore will be handled by six P&H (U.S.) 12 cubic yards shovels, and moved to a crushing unit by means of 32, 120-ton capacity trucks made by the Westinghouse Air Brake Co. (Wabco)—(U.S.). The crushing unit, the concentration plant, and the smelter are being engineered by the Parsons-Jurden Corp., a division of the Ralph M. Parsons Co. (U.S.). The primary rock crusher will reduce the ore to 20-centimeter size and a 1.2 mile conveyor will send the ore to a series of crusher units which will further reduce it to 1.25-centimeter size. Next, the ore will be pulverized by eight of the world's largest ball mills and converted to slurry for concentration by a flotation process to 30% or 40% copper. The smelter, will consist of two reverberatory furnaces and two converters. The entire system with an annual capacity of 145,000 tons of 49% pure blister copper will be operational in 1978.

As of early 1977, tenders were under evaluation for the final unit of the project, a refinery to purify the blister copper to 99.7% pure metal for ingots and direct industrial use. Sarcheshmeh's infrastructure, smelting and refining capability will make feasible the exploitation of some of the smaller deposits in the Kerman-Yazd area including Meiduk (45 million tons), Chahr Gonabad, Darrehzar, and Allahabad. While some metallic copper will be exported, a significant portion is earmarked for domestic use. Plans call for the development of a complex of subsidiary plants at Sarcheshmeh producing copper sheet, rods, cable, and other products.

**Iron.**—Major iron ore deposits are being developed by the Government to provide raw material for a steel industry. The industry will be based primarily on exploitation of large natural gas reserves for sponge iron production by the direct reduction process.

The Bafq area 125 kilometers east of Yazd in south central Iran has estimated reserves of nearly 700 million tons in several locations, the largest of which are Chogart (170 million tons), northern Anomaly (150 million tons), and Chadar Malu (100 million tons). These ores are magnetite and hematite and are up to 65% iron. Ore from Chogart is used to supply the Aryamehr Steel Plant in Esfahan which uses basic oxygen-steel production technology. Development of the other deposits in the Bafq area has been a key objective during the Fifth Plan period. Total production in 1975 was about 1 million tons. These deposits are being exploited by the National Iranian Steel Corporation (NISC), which operates the Aryamehr Steel Plant. Ore is extracted by both open-pit and tunnel methods. Several methods for ore handling and processing were under study in early 1977.

The Arak district in west central Iran has several deposits of iron ore, the largest of which is at Shamsabad and contains reserves of 100 million tons of limonitic hematite with an average iron content of 43%. In early 1977 there were no announced plans to develop these deposits. In 1974, the Government committed \$150 million to develop the Goleghar Iron Mines near Sirjan in Kerman province. Exploratory drilling has confirmed the existence of over 200 million tons of iron deposits. These mines are being developed under an agreement between National Iranian Steel Industry Corporation (NISIC), the state firm developing Iran's direct reduction process steel mills, and Grangesbergs Industriavaru AB. (Sweden). The mines slated to be operational in 1977, should produce 5 million tons of ore annually by 1980. The Goleghar mines are planned to be connected by rail to the proposed new railroad linking Bandar Abbas with the national system through Kerman. Iron deposits at Tangezagah, about



*Open pit mining by the Sarcheshmeh Copper Mining Company relies on U.S. Equipment.*

150 kilometers south of Goleghar were also scheduled for development under the Fifth Development Plan. Iron ore pelletizing facilities are incorporated into the design of the direct reduction steel mills being built by NISIC.

The Government is also investing abroad to secure iron ore supplies for the Iranian steel industry. In 1975, Iran made a commitment to invest \$627 million for the development of iron mines at Kudremukh in Karnataka, India. The first \$150 million increment of this investment was advanced by Iranian authorities in January 1977. Ore is to be shipped by sea to Iran.

**Coal.**—Iran's exploitable bituminous coal reserves are estimated at over 1 billion tons, located principally in the Alborz Mountain range northeast of Tehran and in Kerman province. In 1975 the stated-owned National Mining and Smelter Company and NISC were operating 45 mines which produced an estimated 3 million tons. Much of Iran's coal traditionally has been extracted manually and has been used as fuel for heating brick kilns, beet sugar refineries, and other industries as well as the railroad. Major producing mines include the Kalavi, Tarz, and Dehmolia deposits at Shahrud; the Damghan mines on the Tehran-Mashhad rail line in Semnan province; the Sangrud mines in Gilan province; and the Golbanu and Chesmegol mines east of Mashhad in Khorasan. These mines, as well as the Pabdana (re-

serves, 68 million tons) and the Badamu (20 million tons) have been exploited by NISC for use in the Aryamehr steel mill in Esfahan. Coal washing facilities are operated at Zarand near Kerman, and at Shahrud.

Four new deposits have been identified near Kerman and are under development. These are at Sarapeda, 110 kilometers from Kerman with reserves of 36 million tons, and at Khamrud, 140 kilometers from Kerman. It was announced in July 1974 that further exploration in the Shahrud region had identified additional reserves at Tazreh totaling 40–50 million tons. In January 1975 an announcement was made of the discovery of large coal deposits in the northeast between Gonbad-Kabus and Shahpasand (Mazandaran) and Bojnurd (Khorasan). These deposits were estimated to consist of some 200 million tons. Development of the Alborz, Shahrud, and Kerman mines has been a key objective of the Fifth Development Plan.

**Other Minerals.**—Chromite was discovered in 1940, although commercial exports of the ore did not begin until 1952. The largest known deposits are the Amir, Shahrir and Shahin mines near Bandar Abbas on the south coast. Other deposits have been reported in the Abbasabad region (Semnan/Khorasan), at Shahrud, at Minab and in the Bafq area. Chromite ore production in 1975 was 210,000 tons, of which 89,000 tons valued at \$2.7 million was ex-



ported. Chromite is exported as crude ore. While chromite is mined primarily by the private sector, the largest mine operator being the Shahriar Industrial Group, the Government has encouraged the establishment of plants to concentrate chromite ore into chrome, ferrous-chrome, and other alloys, and several projects were being considered by late 1976.

Iran has large deposits of lead and zinc, and is a leading world supplier of these metals. The greatest private sector metallic ore mining activity has been in the extraction of lead and zinc; of the 43 lead/zinc mines in operation during 1975 in Yazd, Esfahan, Arak, Azerbaijan, Central Province, and Khorasan, 41 were privately operated. Production in 1975 was 96 million tons of lead and 70 million tons of zinc, of which 76 million tons of lead and 68 million tons of zinc ores were exported, accounting for earnings of over \$23 million. The largest deposits under exploitation are the Mehdiabad mines near Yazd with reserves of 24 million tons, the Kushk mines (10 millions ton) near Bafq, the Anguran mines (6 million tons) in Azerbaijan, and the Shahkuh mines (6 million tons) near Esfahan.

The Anguran lead and zinc mine in northern Iran is operated by the Calcimine Company, a subsidiary of one of Iran's largest private mining groups, The SIMIRAN Company. SIMIRAN's other activities include the exploitation of the Shah-ali-Baglou lead mine in central Iran and investment in a joint venture with Dresser Magcobar Corporation (U.S.) for barite mining. SIMIRAN's lead mines produce 55,000 tons annually of 55% calcined zinc/lead concentrate of which 8,000 tons are exported to the U.S.S.R. The balance is further refined by calcining in the firm's 200-ton per day feed capacity concentrator located near the Persian Gulf port of Khorramshahr, and sold to Japanese and European buyers. Anguran is mined by the open-pit method, some 1 million tons of overburden and ore are removed annually.

Manganese is mined at Shahrokh near Qom, and at Tobatkarim near Tehran. Deposits of cobalt, nickel, and mercury have been located, but by early 1977 were not being exploited. Bauxite has been located near Yazd, but has not yet been found to be in commercially exploitable deposits.

Another example of a private mining firm is the Sormak Mining Company, which operates several small mines containing manganese and lead deposits in the Arak area of Central Province. Sormak acquired ownership of the Ahangaran Lead Mine near Malayer in the early 1970's. The mine had been in operation for many years using tunneling to extract high grade ore which was exported to the U.S.S.R. in unprocessed form. Mining was labor intensive, using handheld pneumatic drilling equipment and trucks for ore handling.

When Sormak acquired the mine the high grade ores had been exhausted, but surveys indicated reserves of at least 1 million tons of lower grade ores containing 10% lead in sulfide and carbonate form susceptible to open-pit extraction. The original owners had begun construction of a concentration plant to process these lower grade ores. Sormak set two objectives in upgrading the mining operation; first, increasing extraction capabilities by use of heavy equipment, and second, improvement of the concentrating facility and bringing it up to full capacity.

The open-pit mining operation uses International Harvester and Caterpillar loaders, and Mercedes-Benz dump trucks for ore handling and a hydraulic boom, tracked drilling unit manufactured by Oy Tampla AB, Tamrock Division, (Sweden).

The concentrator includes a jaw crusher of Czechoslovak manufacture, a U.S.-manufactured cone crusher, a French-made ball mill, a flotation system made by Sala Maskin Fabrik AB (Sweden) a locally fabricated thickener, and a Sala built filter system. The concentrator has a feed capacity of 500 tons per day. By early 1977 the mine was producing about 300 tons per day of feed ore which was concentrated into about 30 tons of 50% lead in sulfide.

In 1976 a foreign mining engineer was contracted as a consultant to advise on increasing mine productivity. Plans under consideration by early 1977 to bring the mining and concentrating operation up to full capacity of 500 tons per day included improvement of production management, training and equipment maintenance; acquisition of additional tracked rock drills, loaders and ore carriers, upgrading and possible replacement of concentrator components, and installation of an auxiliary power generator. As a part of the upgrading process for the concentrator a rubberized lining for the ball mill was being procured from Skega AB. (Sweden) to improve milling efficiency.

To acquire sources of fuel for the nuclear power plants scheduled to be installed during 1973-93, the Government has begun exploration for uranium deposits. Uranium has been identified near Yazd, Esfahan, and Hamadan and in Khorasan and Azarbaijan provinces. Soviet geologists were conducting surveys in the Anarak area. Contracts for aerial radiometric surveys were signed in September 1976, with Frankla-Seismos (West Germany), CGS (France) and Austirex (Australia). Exploration activities, slated to begin in March 1977, will cover major portions of the country.

Concurrently, the Government is developing sources of nuclear fuel outside the country. Iran has taken a 20% interest in a consortium called Coredif formed with the governments of Italy, France, Bel-



gium and Spain. Work on a uranium refining plant, located in the Rhone Valley in France, has already started. Site selection is underway for a second plant to be located in France, Italy or Belgium.

**Precious Stones and Metals.**—Two small turquoise mines, which the Government took over in 1975, are located near Nishapur. Their combined output was estimated at \$1.3 million in 1975. Small deposits of rubies, emeralds, and gold exist, but they are not being exploited commercially. The only gold mine in the country, the Muteh gold mine located south of Qom, suspended production in 1972; however, exploiting this mine is included in the Fifth Development Plan objectives. Three lead mines have gold traces which are not being exploited.

**Nonmetallic Minerals.**—Nonmetallic minerals commercially produced include salt, alum, sodium sulfate, silica stone, fullers earth, red ochre, chalk, silica, and gypsum. A phosphate deposit estimated at 12 million tons was discovered in 1976 by the Geological Survey of Iran at Shemshak in the Alborz range 60 km northeast of Tehran. Many of these minerals are exploited by the government-owned Mining and Metallurgical Company of Iran. Small private firms using hand methods are also active in mining these minerals. A small, specialized government-owned mining operation is Foundry Sand Company which is located at Firouzkooh. The mine has a production capacity of 35 tons per hour of foundry sand. German equipment including a crusher, washer and dryer is used. The mine's output is used primarily by the state-owned metalworking complexes Machine Sazi Tabriz, and Machine Sazi Arak, both of which are shareholders in the mine.

Magcobar Iran, subsidiary of Dresser Magcobar Corp. (U.S.) mines barite and bentonite for use in the petroleum industry. Established in 1962, the mines produce 440 tons of barite and 400 tons of bentonite a day. The mine employs 357 persons and covers 250,000 square meters. Equipment includes 27 Holman (U.K.) compressors, 5 Schoff (German) loaders, and 3 R.M.P. (U.K.) mine locomotives; ore cars produced by an Iranian firm, Vazneh Co., are used.

In 1976, 468 mines and quarries employing 7,880 people produced stone. Twenty-six percent of all operations were concentrated in the vicinity of Tehran which is also the country's largest market for construction materials. Quarrying for marble, limestone, sand and aggregates accounted for over one-half of all mines in this category.

## Principal Government Organizations

The Ministry of Industry and Mines has the prime responsibility for the management of Iran's mineral resources. The Ministry's mining division regulates

private mining activity by issuing exploration licenses and mining operation permits; it also develops legislation relating to the mining industry. In addition, the Ministry is responsible for the development of information and statistics.

The Government is active in the mining industry through the operation of a number of state-owned mining companies. The Mining and Metallurgical Company of Iran located at 467 Takhte-Jamshid Avenue (the corner of Malek-O-Shoara Bahar Street in Tehran) operates 40 mines which provide raw materials for other state-owned enterprises. This corporation's operations range from coal and lead mines to quarries for sand and marble. In 1976, the agency had a budget of \$6.7 million of which \$5.7 million was earmarked for mining development: Production targets set for 1976 included:

Coal .....	21,000 tons
Crude lead .....	1,000 tons
Concentrated lead .....	8,700 tons
Crude nitrate .....	2,000 tons
Crude copper .....	1,500 tons
Crude calcite .....	900,000 tons
Crude salt .....	100,000 tons
Marble .....	1,800 tons

The state-owned investment and holding company, the Industrial Development and Renovation Organization (IDRO) has made limited investments in mining exploration and development. The National Iranian Steel Company, located at Kakh Square, Ettihad Street, Tehran, the state-owned operator of the Esfahan Steel Mill, is engaged in the exploitation of iron ore and coal deposits to obtain raw materials for steel manufacturing. The National Iranian Steel Industry Corporation, is also developing iron deposits in connection with its responsibilities for building a direct reduction process steel industry.

The Geological Survey of Iran located on Mehrabad Avenue near Mehrabad Airport in Tehran (P.O. Box 3285, Tehran) is the primary government organization responsible for geological exploration. The Geological Survey has a staff of over 200 geologists and operates a complete geophysical laboratory. This organization is actively engaged in a program of field surveys and geological mapping.

## TRENDS, PROGRAMS, AND PROJECTS

Iran's Fifth Development Plan (1973/74-1977/78) projected \$1 billion to be spent on mining projects during the plan period. Although Iranians have been active in the mining of copper, turquoise, gold and silver for centuries, the Government began only in the 1970's to channel heavy investments to tap the nation's mineral deposits. Most of the planned expenditures consist of investment in iron ore and coal



mining as well as open-pit mining of copper deposits. Large sections of Iran virtually are unexplored, and efforts have been planned to geophysically map over 25% of the country's surface during the Fifth Plan period. The general aim in the development of the mining industry is to meet the raw material needs of the growing domestic industrial sector, to build up reserves where possible, and to integrate mining activity with industrial expansion. While some mining output has been exported in the past, the exploitation of deposits of iron ore, coal, copper, uranium, and other mineral resources is directed at meeting the needs of the developing domestic steel mills, cable and other industries using copper, nuclear power, and construction activity.

Iran did not have a comprehensive mining law until 1957. This law was amended in 1972 and in 1974 to establish government control over much of the mineral wealth in the country. Under the amended laws, mines have been divided into three categories. The first category is "building materials and quarries" which includes marble, lime, gypsum, sand, aggregates, graphite, and quartz. Owners of land on which these materials are found can make personal use of them without a license. Commercial use, however, requires that a license be obtained. The owner of the land, if other than the exploiter of the deposit, receives 3% of all mine proceeds and the Government receives 5%. The second mining category includes all precious stones such as rubies, emeralds, diamonds, and turquoise as well as metals such as chrome, cobalt, manganese, lead, zinc, gold, silver, nickel, salt, and nitrate ores. Private enterprise can exploit such minerals, but the Ministry of Industry and Mines regulates the private mining activity by issuing separate permits, first for exploration, second for the formation of a mining corporation to exploit specific deposits, and finally for the actual initiation of production. The third category of mines includes fuels and minerals considered to be part of the national wealth, for which exploitation is limited to the Government itself. By 1977, coal, iron ore, and copper had been placed in this latter category.

The Government invests directly in mining development including exploitation and processing of all nationalized minerals, and also encourages private investment in the mining industry. The Government provides incentives for private firms to exploit mines not included in the category of nationalized minerals. Mining legislation has been designed to establish the framework for the development of mineral resources by the Government and private sectors. Low-interest Government-financed loans are available to the private sector to provide the large amounts of capital needed for exploitation. The Geological Survey of Iran is responsible for making

information available to the private sector concerning mineral resources that are open for exploitation.

Government investment policies for mining have evolved from two fundamental objectives. The first is based on the definition of valuable natural resources as part of the national wealth, and the Government has intervened to ensure that revenues from resources ranging from water and forests to copper and petroleum accrue to the public sector. Thus, in the years after 1965, almost all categories of resources discovered in significant amounts were nationalized. As has been the case with petroleum, the revenues from the exploitation of Iran's natural resources are to be funneled through the government agencies for development projects throughout the country. The second fundamental objective has been to ensure that the mining industry is developed at a pace parallel to the overall industrialization of the country. This has been difficult to implement because of the sheer size and sophistication of many of the projects; the domestic private sector does not have the resources to develop the larger mining operations. Increasingly, foreign assistance has been called upon to implement the projects. In the mining industry, foreign involvement has taken the form of technical assistance contracts rather than equity in joint ventures.

The Government sees its primary shortage as technology, not capital and is following a policy of contracting with foreign companies for technical services to develop and exploit mineral resources. For example, the Government has signed a technical agreement with a Swedish firm to exploit the Golghar iron mines, and with U.S. firms for the development of the Sarcheshmeh Copper Mine in Kerman.

Total expenditures allotted for mining, prospecting and geological surveys in the Fifth Development Plan were \$982 million of which 90% was to come from the public sector. The largest amount \$893 million was earmarked for extraction and exploitation, while \$1 million was allocated for surveys, prospecting, and technical assistance to the private sector. Projects for the mining sector during the Fifth Development Plan period include geological and mineralogical survey, exploitation, and processing.

Geological and cartographic surveys were to be carried out over an area of 700,000 square kilometers, and maps with scales of 1:250,000, 1:100,000, and 1:50,000 prepared. Basic mineralogical surveys were to be carried out over an area of 400,000 square kilometers (one-quarter of the country's surface). Primary surveys undertaken in the first phase are to be followed up by more detailed exploration in promising areas. Priority is to be given to minerals required by domestic industry including phosphate, bauxite, potassium, uranium and zinc.

Exploitation of proven mines of copper, iron, coal, lead, zinc, chromite and other ores is to be stepped up, with emphasis on developing the processing of crude ores into usable form. Key mines selected for development include:

- Copper mines at Sarcheshmeh, Mieduk, Char Gonabad, Abbasabad, Allahbad, and Darrehzar
- Iron mines at Chogart, Chadar Malu, Tang-e-Zagh and Goleghar
- Coal mines at Kerman, Shahrud, and in Alborz region
- Refractory clay deposits and other steel mill materials
- Chromite mines
- Gold mines at Muteh
- Lead deposits of Nakhlak and Qanat Marvan (Bafq)

Survey work and exploration is being carried out by the Geological Survey through government-to-government technical assistance and through contracts with private, foreign, and domestic firms. In 1976 the Geological Survey contracted with Iranian firms to conduct geological exploration work in a 7,200 square kilometer area in the area south of Bandar Abbas (Parakal Co.), 69,000 square kilometers in southern Khorasan and northern Sistan province (Water and Soil Co.), and 66,000 square kilometers in northern Sistan and southeastern Khorasan (Geometal Co.). In late 1976, The Atomic Energy Organization of Iran through its consultant URIRAN initiated a \$300 million 10-year program for aerial radiometric surveys in eastern Iran to identify sources of uranium fuel.

## GROWTH PROSPECTS

The mining industry virtually stagnated for decades. As late as 1975 antiquated methods of extraction predominated, and little exploration activity was undertaken. Private owners did not invest substantially in their mines because of fear that the Government would nationalize all mineral deposits. Private capital investment for new mines and replacement equipment was under \$10 million yearly from 1950 to 1965.

The Fourth Development Plan, allocated increased development funds for the private sector through the banking system both for the establishment of new mines and the modernization of existing facilities. However, the development funds set aside for mining in the Fourth Development Plan were not fully utilized. The revised Fifth Development Plan allocated \$720 million in fixed investment by the end of the Plan period. By 1976, over 90% of the projected expenditures had been made, and over \$1.3 billion is expected to be spent on mining during the

Plan period. The largest expenditures in mining have been a direct result of government intervention with the Government accounting for nearly 90% of all capital expenditures. In 1973-75, the Industrial Mining and Development Bank, which acts as a channel for government funds to the private sector, made only .5% of all development loans to mining companies. In 1976 over 90% of all new capital investment in mining was undertaken by the Government.

Government policies and investment in mining will continue to be a strong influence in shaping the growth of the industry. However, government policies have had a dampening effect on increased private investment in the industry. The owner of one long-established private mining company explained that he was afraid to expand and modernize his operations for fear of looking too prosperous and risking nationalization by calling attention to the potential of the deposits he was mining. The Government has clearly failed to provide the necessary atmosphere of confidence which would make the private sector receptive to increasing its investment in mining. If the Government is to succeed in this objective, it will have to find some way of increasing incentives and providing greater assurances to private mining investors.

The exploitation of coal and iron deposits has been given high priority. Iran's consumption of steel has been rising rapidly; reaching 3.4 million tons in 1975, it is projected to amount to 10 million tons by 1980. The Government hopes to produce the majority of the nation's steel requirement by 1983. The Government has also invested abroad in an effort to meet the needs of the growing domestic steel industry. It is likely that domestic mines will supply a substantial portion of Iran's iron ore and coal requirements by 1980.

The Government's emphasis on exploration for new mineral deposits will undoubtedly result in the discovery of new reserves. During 1974-76, 780,000 square kilometers were mapped by the Geological Survey of Iran and significant deposits of uranium, nickel, phosphates, and additional deposits of copper and iron ore were discovered. After tests and feasibility studies are completed, many of these deposits will be added to the priority development list, and projects will be implemented during the Sixth National Development Plan. Iran's extensive mineral resources will likely become a major source of national income in the future and play a key role in the reduction of Iran's reliance on oil revenues.

## CAPITAL GOODS MARKET

The market for mining equipment in Iran rose from \$36 million in 1973 to over \$224 million in 1975 (see table 5). Most of this increase was due



**Table 5.—Iran: The Market for Mining Equipment**  
(thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>MINERAL ORE EXTRACTION EQUIPMENT</b>					
Domestic Production .....	0	0	0	0	700
Imports					
United States .....	4,051	5,087	12,871	11,000	17,400
West Germany .....	2,104	6,512	8,411		
United Kingdom .....	660	1,428	3,608		
Japan .....	370	890	1,925		
Eastern Europe <sup>2</sup> .....	633	3,100	6,430		
Others .....	1,443	2,532	3,560		
Total .....	9,261	19,549	36,805	33,800	49,000
Market Size .....	9,261	19,549	36,805	33,800	49,700
<b>MINERAL ORE HANDLING AND PROCESSING EQUIPMENT</b>					
Domestic Production .....	0	60	230	410	900
Imports					
United States .....	1,463	2,565	18,450	4,830	6,600
West Germany .....	8,025	14,042	69,014		
United Kingdom .....	3,092	5,094	14,949		
Italy .....	2,337	5,873	14,930		
Eastern Europe <sup>2</sup> .....	8,147	20,585	62,680		
Others .....	4,258	9,680	7,543		
Total .....	27,322	57,839	187,566	83,288	145,700
Market Size .....	27,322	57,899	187,796	83,698	146,600
<b>TOTAL MINING EQUIPMENT MARKET</b>					
Domestic Production .....	0	60	230	410	1,600
Imports					
United States .....	5,514	7,652	31,321	15,830	24,000
West Germany .....	10,129	20,554	77,425		
United Kingdom .....	3,752	6,522	18,557		
Italy .....	2,383	6,235	15,735		
Eastern Europe <sup>2</sup> .....	8,780	23,685	69,110		
Others .....	6,025	12,740	12,223		
Total .....	36,583	77,388	224,371	117,088	194,700
Market Size .....	36,583	77,448	224,601	117,498	196,300

<sup>1</sup> Estimates.

<sup>2</sup> Principally U.S.S.R., Poland, Czechoslovakia, Romania.

Source: United Nations, Organization for Economic Cooperation and Development, supplier country, and official Iranian trade statistics; estimates based on trade interviews.

to the heavy emphasis by the Government on exploitation of copper, iron ore, and coal deposits in the country. Domestic manufacturing of mining equipment is negligible and the equipment needed in the mining industry in 1975 was nearly all purchased from foreign suppliers. In 1980, expenditures for equipment by the Iranian mining industry are expected to be just under \$200 million.

## Imports

U.S. suppliers, who held less than 10% of the total import market in 1974, increased their market share to almost 14% in 1975. Sales of heavy shovels and specialized ore hauling trucks to the Sarcheshmeh Copper Mines in Kerman contributed to this increase.

West German suppliers, who have supplied 25–30% of the total market since 1970, accounted for 34% of all 1975 imports, consisting chiefly of crushing equipment, conveyor systems, and drying units. West German suppliers have established an excellent reputation in the mining industry for the high durability of their equipment and they are using this reputation to great advantage.

Suppliers from the United Kingdom, who generally accounted for about 10% of the market through the 1970's, also tripled sales in 1975 from 1974 levels. British firms supply mainly compressors, crushing equipment, and pneumatic tools.

Eastern European countries, such as Czechoslovakia, Romania, Bulgaria, and the U.S.S.R. supplied about one-third of Iran's mining equipment imports in 1975. Imports from these countries consisted mainly of basic, low technology equipment. In 1973, these countries supplied nearly one-fourth of all imported equipment and were especially active in the sales to private mining and quarrying companies. The Government's decision to obtain technology from Western countries for exploiting large mineral deposits should begin to depress the market share of Eastern European suppliers in 1976–80.

## Domestic Manufacturing

Domestic manufacturing supplies only a small amount of the needs of Iran's mining industry. Conveyor systems, mine jacks, and other shaft support equipment are fabricated by the state-owned Arak Machinery Manufacturing Company, which also fabricates dump beds for Wabco heavy ore trucks under license. Ore cars are manufactured by Vazneh Company. In the late 1970's, it is expected that some compressors and hydraulic power tools planned to be manufactured by Machine Sazi Tabriz, will be sold to the mining industry. It is estimated that domestic manufacturers will account for no more than 1% of total sales in 1980.

## MARKETING OPPORTUNITIES

The market is growing for both equipment and services for Iran's mining industry. Services in 1977–85 will be purchased almost exclusively by government mining companies, where as private firms will primarily buy equipment. A good market is expected for the following equipment:

**Survey and Exploration Equipment.**—Iranian programs for exploration to determine mineral reserves will require extensive use of prospecting drills, pneumatic tools and surveying, density, depth and other measuring devices. Testing equipment, portable analytical X-ray equipment as well as reagents and

chemicals needed for analysis of ore samples will also be in demand.

**Ore Extraction and Processing Equipment.**—The development and exploitation of Iran's coal, iron ore, and copper reserves will require large imports of mining equipment. Plans for intensive, large-scale modern mining will result in needs for a wide range of new ore extraction and processing equipment. Mining industry sources indicate they are interested in diversifying their sources of supply and acquiring advanced equipment and technology. Open-pit mining as well as underground mining will require extensive use of power shovels, scrapers, dumpers, loaders, wheeled and tracked ore transporters for underground and open-pit mining.

Compressors, pneumatic drills, blasting equipment and instrumentation will be needed for ore extraction. It is also likely that there will be increased use of mobile hydraulic boom drilling units and other specialized extraction equipment. In addition, ore beneficiation in both the Government and the private sector will require conveyor systems; fixed and portable crushers; mills; fixed and portable flotation equipment; heavy media, magnetic, electrostatic, and gravity separators; pyrometallurgical and other processing units.

**Safety Equipment.**—The Government is requiring that all mine operators, both government and private, use safety equipment in order to prevent major accidents. Such items as ventilation equipment, air sampling, and gas detection devices, nonsparking tools; as well as goggles, helmets, lamps, and other miners' equipment should find good demand during 1977-85.

**Mining Services and Technical Agreements.**—The Government's development of recently discovered deposits of coal, iron ore, copper, uranium, gold, and other minerals is expected to require a wide range of technical agreements with foreign companies for the design, construction and operation of mining and ore processing facilities. Foreign technology will continue to play an important role in the exploration and surveying of Iran's national resources.

## MARKETING ENVIRONMENT

### Buyers' Universe

The major purchasers of equipment and technical expertise in Iran's mining industry are the state-owned companies (see table 6). The large mining operations under the technical management of foreign companies normally follow selective tendering procedures in which the prime contractor drafts specifications for the required equipment and pre-

qualifies companies. The Mining and Metallurgical Company of Iran normally purchases equipment in bulk quantities due to the large number of operations under its control.

Approximately 100 privately owned mining companies purchase limited amounts of equipment. These companies normally buy equipment through suppliers' representatives located in Tehran. Many of these mining companies do not have an office in Tehran and rely heavily on their suppliers for technical information and equipment recommendations.

### Foreign Suppliers' Universe

Only a small number of foreign suppliers are active in the Iranian mining equipment market. Approximately 20 to 25 firms from Western countries

*Table 6.—Iran: Principal Mining Companies, 1976*

GOVERNMENT	
Industrial Development and Renovation Organization (IDRO)	
Mining Division	
Pahlavi Avenue	
Jam-e-Jam Street	
Tehran	
Mining and Metallurgical Company of Iran	
467 Takhte-Jamshid Avenue	
Tehran	
(General Mining)	
National Iranian Copper Industry Corporation	
5 Boulevard Queen Elizabeth II	
Tehran	
(copper)	
National Iranian Steel Company	
Kakh Square	
Ettehad Street	
Tehran	
(iron, coal)	
National Iranian Steel Industry Corporation	
Shah Abbas Crossing	
261 Takhte-Tavoos Avenue	
Tehran	
PRIVATE	
Doona Mining Corporation	
345 Villa North Avenue	
Tehran	
(lead/zinc)	
Minak Company	
5 Alvand St.	
Bucharest Avenue	
Tehran	
(copper)	
SIMIRAN Company	
732 Saadi Avenue	
Tehran	
(lead, zinc, general mining)	
Shahriar Industrial Group	
4 Nasser Avenue	
Tehran	
(chromite)	
Sormak Mining Company	
34 Kouye Latifi	
Shiraz Avenue	
Tehran	
(general mining)	

Source: Trade interviews.



plus the Soviet Union, Romania, Poland, Bulgaria and Czechoslovakia supply most of the market.

Drilling equipment and loaders are supplied by Ingersoll-Rand Co. (U.S.). Broom & Wade, Ltd., International Compressed Air Corp. Limited (CompAir) and Holman Bros. Ltd. (U.K.) are the major suppliers of the compressors used in the mining industry. Tracked hydraulic boom drills have been supplied by Tampla AB. (Sweden). Loaders are sold by Caterpillar Tractor Company (U.S.), Clark Equipment Company (U.S.) and Schoft GmbH (West Germany). Mine Minerals Cie (France) sells both survey equipment and some extraction equipment to private Iranian mine operators. Ore cars used in mines are supplied almost exclusively through the state export companies of Bulgaria and Romania. P&H and Marion Power Shovel Co., Inc., (U.S.) provide large shovels to the Iranian Government's mines. Wabco (U.S.) sold 32 120-ton trucks for use in the copper mine at Sarcheshmeh.

The U.K. firm Integrated Handling, Ltd. is a leader in the sales of rock conveying equipment, as is Allen Industrial Products, division of Stolper Industries, Inc. (U.S.). Hirschman Gebr. (West Germany), Joy Manufacturing Co. (U.S.) and Progroinvest, the East German state-owned export company, along with Mitsubishi Corp. (Japan) and Klemmann's Vereinigte Fabriken AG. (West Germany) are the leading suppliers of rock crushing equipment and vibrating shakers. Bawar GmbH (West Germany) is a leading supplier of ore drying equipment.

## Marketing Factors

At least six suppliers' representatives have been successful in selling equipment to private mining companies. They are:

Jupiter Trading Co.	Iran Mintech Co.
152 Shah Reza Ave.	21 Villa Ave.
Tehran, Iran	Tehran, Iran
Diesel Power Co.	Auto Tehran
100 Villa Ave.	575 Shemiran Ave.
Tehran, Iran	Tehran, Iran
Parosan Co.	Niala Co.
Soraya/Iranshahr Ave.	130 Shahabass
Tehran, Iran	Tehran, Iran

Much of the equipment bought by these private mining companies, however, has been from Eastern Europe and is purchased through East European Embassy Commercial Sections and state trading companies.

Most representatives do not stock equipment in the country, but instead sell mainly through catalogs. An exception to this rule is Ingersoll-Rand

which is a leading supplier of high pressure compressors, hydraulic tools, and other mining equipment. This firm has both sales and service capabilities in Iran, which is not normally the case.

The appointment of an authorized representative or distributor is vital for long-term sales of mining equipment in Iran. Authorized representatives of foreign firms selling mining equipment normally employ a small sales force to visit government and private mining companies, many of which are headquartered outside of Tehran. These salesmen also furnish information to their principals on upcoming tenders. Private buyers in particular rely heavily on suppliers for technical advice and equipment recommendations and base their decisions on the confidence built up through long-term relationships. Several government projects are being developed on the basis of government-to-government trade protocols, in which supplier participation is not open to international competition.

No congresses, symposiums or trade shows that involve mining equipment are held regularly in Iran. The Mine Owners Syndicate represents private mine owners and is located on Lalezar Avenue in Tehran.

## COMPETITIVE POSITION OF U.S. SUPPLIERS

At least 10 U.S. firms regularly export mining equipment to Iran. Wabco is represented in Iran by a branch office. Caterpillar also is represented through a branch office with a separate service facility in Ahvaz. Other firms normally deal through distributors and authorized representatives. However, in general, U.S. mining equipment suppliers do not have a high degree of visibility in the Iranian market.

U.S. firms have a distinct technological advantage in sales of high capacity mining equipment for extraction, transportation and processing of ore, and they have made significant sales. Many of the large government projects are being developed using modern high volume mining technology and equipment on the basis of contracts with firms who are leaders in specified fields of mining technology. Smaller, privately owned mines are beginning to invest in modern, higher capacity equipment, and this development could also provide increased opportunities for U.S. suppliers. Another development which could benefit U.S. sales is the move away from the extraction of unprocessed ore for export to ore concentration and refining to supply domestic industrial requirements, to make possible the exploitation of lower grade ore deposits, and to increase value added in exports. U.S. firms will have to increase their market development activities to compete with the well-established Western and East

European suppliers. The ability to provide financing may become an increasingly important factor in

sales of equipment to both government and private mining firms.

## Petroleum

### STRUCTURE AND SIZE

Petroleum has played an increasingly dominant role in Iran's economy since the first well started production at Masjed-e-Soleiman in 1908. Iran accounted for 10% of world crude production in 1976 and lifted 26.6% of the oil produced in the Middle East. Estimates of proven reserves are 65–70 billion barrels, or enough for slightly over 30 years at 1976 levels of production.

Government income from the oil industry rose from \$1.3 billion in 1970 to \$4.3 billion in 1973 and then jumped to \$19.1 billion in 1974 following the price increase by the Organization of Petroleum Exporting Countries (OPEC) (see table 7). It was \$19 billion in 1975 and was expected to reach \$22 billion in 1976. If the present trend continues income could reach \$38 billion in 1980.

Crude oil production showed an average annual growth rate of just under 12% between 1970 and 1974, but in 1975, due to lower world demand for oil and the slightly higher price of Iranian crude on the world market, production fell by 11.2% to 1,953 million barrels. In 1976 demand strengthened and annual production reached 2,168 million barrels. During 1970–75, oil revenues rose from 75% to 87% of Iran's foreign exchange income. Exports of crude oil and refined products in 1976 were 1,904 million barrels and 78 million barrels, respectively.

Until the 1970's, Iran's gas reserves were not used much. Evaluations in the mid-1970's indicated total reserves of approximately 400 trillion standard cubic

feet, accounting for some 15% of the world's total. Roughly half of these reserves are in the form of associated gas which is produced with oil from the major oil fields. However, there are other important gas fields, both onshore and offshore, which are to be exploited. In the mid-1970's huge reserves were discovered which indicate that Iran possesses the largest proven reserves in the world after the U.S.S.R. Production of natural gas rose from 2.7 billion cubic feet per day in 1970 to 4.5 billion cubic feet per day in 1975 (see table 8). Domestic consumption accounted for 1 billion cubic feet per day while nearly 1 billion cubic feet per day were exported to the U.S.S.R.

Lack of markets has resulted in most of the gas associated with oil production to be flared off. However, in addition to exports, home and commercial use, electricity generation, industrial use and reinjection in production have sharply increased the demand for gas in Iran. The share of the nation's total energy provided by gas was expected to rise from 9.4% in 1974 to 17% in 1976, when consumption of natural gas for electrical power generation was estimated to be 208 million cubic feet per day. In 1975 about 100 industrial units were operating with natural gas as their main fuel source.

### Gas and Oil Capital Investment

As a result of Iran's increased foreign exchange earnings from petroleum and natural gas exports, planned capital investment in the development of

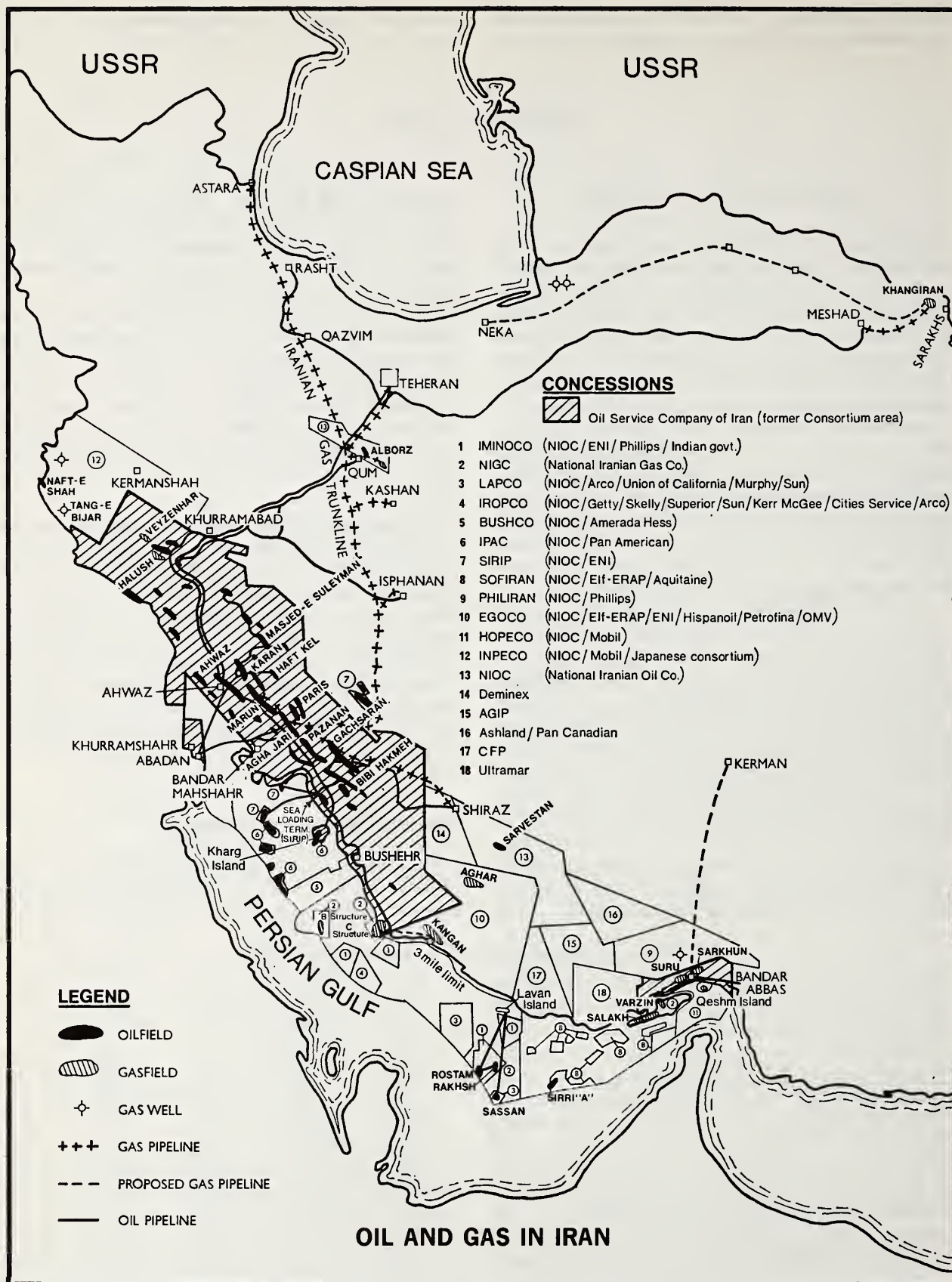
Table 7.—Iran: Principal Indicators for Petroleum Development

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
Crude Oil Production (millions of bbl/yr) .....	1,397	2,139	2,198	1,953	2,168	2,601
Total Crude Exports by NIOC, Consortium and Joint Ventures (millions of bbl/yr) .....	1,208	1,927	1,960	1,705	1,904	2,276
Refinery Throughput Capacity (millions of bbl/yr) .....	219	240.9	277.4	301	350	550
Actual Throughput (millions of bbl/yr) .....	200.8	214.6	230.3	249.7	285	450
Internal Sales of Refined Products (millions of bbl/yr) .....	N.A.	94.16	107.9	127.9	147	225
Exports of Refined Products (millions of bbl/yr) .....	115.5	100.4	102.0	77.5	66.5	N.A.
Total NIOC Retail Outlets .....	N.A.	12,016	12,259	12,473	12,620	13,200
Tank Trucks .....	N.A.	N.A.	4,788	4,945	5,100	5,800
Pipeline Usage (millions of ton/kilometers) .....	N.A.	7,394	7,952	10,356	11,909	20,800
Well Drilling (thousands of meters) .....	171	265	326	425	467	671
Government Revenues from Oil Industry (billions of US\$) ..	1.3	4.3	19.1	19.0	22	38
Oil Revenue Share of Government Income .....	49%	53%	87%	83%	88%	80%
Share of Oil in GNP .....	11%	17%	42%	35%	41%	36%
Oil Revenue Share of Foreign Exchange .....	75%	72%	93%	87%	91%	85%
Capital Investment (millions of US\$) .....	137	990	1,110	1,115	1,500	1,500

<sup>1</sup> Estimates.

Source: National Iranian Oil Company Statistics, Central Bank Statistics, NIOC estimates.





**Table 8.—Iran: Principal Indicators for Natural Gas Development**

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
Production of Natural Gas ( <i>Millions of ft.<sup>3</sup>/day</i> ) ..	2,772.0	3,894.0	4,963.0	4,520.0	5,100.0	5,800.0
Consumption ( <i>Millions of ft.<sup>3</sup>/day</i> )						
Oil Field .....	924.0	1,185.0	1,296.0	1,164.0	1,370.0	5,800.0
Home & Commercial .....	.3	19.4	30.2	37.4	45.0	120.0
Electricity Generation .....	2.0	39.0	121.0	156.4	208.0	725.0
Industries .....	15.1	23.3	115.0	180.5	650.0	1,036.0
Total Local Consumption .....	941.4	1,266.7	1,562.2	1,538.3	2,273.0	7,681.0
Export to U.S.S.R. ( <i>Billions of ft.<sup>3</sup></i> ) .....	134.1	307.0	321.1	332.0	352.0	565.0
Export Earnings ( <i>Millions of Dollars</i> ) .....	26.68	90.76	93.8	97.9	103.0	165.0
Capital Investment Budget of NIGC ( <i>Millions of US\$</i> ) .....	20.0	46.1	36.9	65.0	284.0	415.8

<sup>1</sup> Estimates.

Source: NIGC Official Statistics, Central Bank Statistics, trade estimates.

oil resources for the Fifth National Development Plan period was revised upward from \$1.86 billion to \$4.76 billion. The National Iranian Oil Company (NIOC) is the major investor in the oil industry. In 1976 NIOC acquired long-term loans from the International Bank for Reconstruction and Development to obtain badly needed technical assistance.

During the Fifth Plan period, natural gas development will absorb \$2.5 billion in capital investment. Of this, \$775 million will come from general revenue, over \$1 billion from the National Iranian Gas Company (NIGC), and \$700 million from foreign investment. The natural gas industry is controlled by NIGC, which was formed in 1967 as a wholly owned subsidiary of NIOC. NIGC has the primary responsibility for production, processing transmission, distribution, utilization, and export of natural gas.

NIOC dominates the industry. NIOC had revenues of \$18.8 billion in 1975, bringing it from third place to second place in Fortune's list of the 500 biggest corporations outside the United States. In that year, NIOC, displaced British Petroleum Co., Ltd. (U.K.), but was still well behind Royal Dutch Petroleum Company's (Netherlands) sales of \$32.1 billion. NIOC's growth has been due largely to the continued "Iranianization" of the oil industry, which began when the company was formed in 1951 following the nationalization of the Anglo-Iranian Oil Company.

The year 1973 was a landmark in the process of the Iranianization of the industry. On July 31, 1973, the Shah signed the Purchase Agreement of 1973, retroactive to March 21, which made NIOC the operator as well as the owner of the major oil fields in the Khuzistan province. Until then the Iranian Oil Consortium, a group of foreign oil companies, had operated the oil fields. This organization was legally reconstituted as the Iran Oil Participants Limited (IOP) and became the purchaser of most of the crude oil produced by NIOC.

According to the Purchase Agreement, IOP was to continue the operating function of the Iranian Oil Consortium. IOP formed an Iranian company called the Oil Services Company of Iran (OSCO) which contracted to assist NIOC in the operation of the Khuzistan fields. The initial contract runs to 1978. Of the service companies under contract to NIOC, OSCO is by far the largest. It is involved in almost all aspects of the oil industry—exploration, drilling, production, and transportation. In 1975, OSCO initiated a program of seismic surveys with the aim of discovering new gas reserves to supply its massive gas injection program for secondary recovery in 1975. And in 1976, it was the major operator of exploration and development drilling projects, and carried out over 293,000 meters (961,000 feet) of development drilling and 45,000 meters (148,000 feet) of exploration drilling.

**NIOC and Affiliates.**—Since its formation in 1951, NIOC, which is totally owned by the Government, has gained capability in nearly every aspect of the oil industry and by 1976 was engaged in a wide range of activities, from exploration in the North Sea oil fields to refining in South Africa. NIOC also operates its own crude and product tankers through charter, ownership, and joint venture arrangements (see Transportation chapter). NIOC is not only directly engaged in industry operations, but also holds major equity positions in a number of joint venture companies operating in the industry. Major and minor international oil companies participate in the Iranian oil industry either through these joint venture arrangements or as contractors to NIOC (see list at end of chapter).

NIOC has full control over the refining, sales and marketing of oil products within the country. In 1975, throughput capacity of Iran's five refineries was 300 million barrels per year and actual output was 250 million barrels. Growth of refining capacity has averaged 7.5% per year and is expected to accelerate (see Chemical Industries chapter). Local demand



for petroleum products grew at an annual average of 16% from 1973 to 1975. In response to the rapid growth in demand, NIOC has concentrated efforts on expansion of its distribution system. In the beginning of 1976, 1,730 railroad tankers were carrying oil products. Development of pipelines and provincial oil refineries are considered high priorities by the company. Product pipelines totaled (3,422 kilometers) in 1975 with another (960 kilometers) under construction and scheduled for completion in 1976.

The first stage of the Ahvaz-Tehran (also called Ahvaz-Rey) crude pipeline was completed in 1974. This is a 30- by 26-inch line, 735 kilometers long, and with an initial capacity of 111,000 barrels per day (bbl/d). A second stage will involve added pumping stations and boosting of first-stage pumping stations to increase the capacity to 455,600 bbl/d from Ahvaz to Tange-Fanni, 372,600 bbl/d from Tange-Fanni to Razan, and 294,600 bbl/d from Razan to Shahr-e-Rey, the industrial suburb south of Tehran which is the site of the Tehran refineries. The first two segments of this second stage were in the final completion phase in late 1976.

Mid-1975 saw completion of the first stage of the Tehran-Tabriz pipeline, a 606-kilometer, 14-inch line to carry gas oil, kerosine, and gasoline to Tabriz. The second phase includes four new pumping stations to raise capacity to 87,000 bbl/d of crude oil for the Tabriz refineries. Contractors for construction of this project are Morrison-Knudsen Co. Inc. (U.S.) in a joint venture with two Iranian firms, Neda and Akhgar, who are installing turbines at all four of the new stations.

## Exports

According to the Purchase Agreement of 1973, NIOC is allocated a specific quantity of crude for direct export, call the "stated quantity." The remaining crude, after takeoff for internal consumption and NIOC's direct sales, is allocated to IOP companies in proportion to their equity shares in IOP. NIOC's stated quantity was set at 200,000 bbl/d in 1973, 300,000 bbl/d in 1974, 450,000 bbl/d in 1975, and 600,000 bbl/d in 1976. In late 1975 and early 1976, NIOC accused IOP of underlifting Iranian oil. As a result of this dispute, NIOC has put a great deal of effort into marketing of its oil—as the rapid rise in direct exports attests. NIOC's actual exports of stated quantity oil rose from 306,000 bbl/d in 1975 to 850,000 bbl/d or 91.4% of total production in 1976.

In addition to the oil produced and exports from the Khuzistan oil fields, there are four offshore oil producing joint ventures. Each of these joint ventures is owned 50% by NIOC and the other share-



*The major crude oil export point is the Kharg Island Terminal served by land and submarine pipelines from all major inland fields.*

holders are various foreign oil companies. In 1976, these companies produced 450,000 bbl/d, all of which was exported.

## Natural Gas Development

Of the 1975 production, 4 billion cubic feet per day was associated gas from the Khuzistan fields. With the discovery of new gas fields, the Government is planning to use natural gas as a primary and inexpensive source of energy. Spur lines to Shiraz, Esfahan, Kashan, Tehran and the new Alborz Industrial City are feeding a growing number of industries. A domestic natural gas distribution network is being laid in north Tehran by local contractors under the supervision of Sofregaz (France). Plans also call for supply of natural gas to numerous brick kilns around Tehran, which presently burn heavy fuel oil and are among Tehran's leading industrial air polluters.

Associated gas is used by NIOC in the Khuzistan fields and at Abadan Refinery, by Kharg Chemical Company and by Shahpur Chemical Company. NIOC and Oil Services Company (OSCO) also produce some 120 million cubic feet per day of nonassociated high pressure sour gas for delivery to Shahpur Chemical Company.



Ahvaz, situated on the Karoun river in close proximity to the Khuzistan oil fields, is fast developing as an important industrial city. A 16-inch natural gas delivery pipeline was completed from the oil fields to Ahvaz in 1975. With the development of major industrial complexes in the city, such as a direct reduction steel mill and a 290-megawatt electric power plant, demand will rise rapidly from the 3.8 million cubic feet per day rate in 1975. This system, which will be connected to the Iran Gas Trunkline (IGAT) which stretches from the southern oil fields to Astara in the north, will be expanded to 200 kilometers of pipeline capable of delivering 185 million cubic feet per day to Ahvaz.

NIGC has discovered gas reserves estimated at 3 trillion cubic feet of sweet gas and 18 trillion cubic feet of sour gas at Khangiran, near Sarakhs in the extreme northeastern corner of Iran. NIGC plans to continue development of this field to provide the energy for industrial development of this region. In 1973 NIGC completed a system consisting of a gas refining unit and 120-kilometers of 16-inch pipeline to deliver 35 million cubic feet per day of sweet gas to Mashhad. In 1975 several industries were already using the gas, and work was in progress to expand the distribution system for power generation, household and industrial use.

Iran exported 330 billion cubic feet of natural gas to the Soviet Union in 1975 through the 1,100-kilometer trunkline (part of the Iranian Gas Trunklines Systems) from the southern oil fields to Astara on the Iran-Soviet border. Completed in 1970, this system consists of gathering stations for associated gas from the southern oil fields, the Bid Boland Gas Treatment Plant (BID), and transportation pipelines to the border as well as 665 kilometers of spur delivery systems to Tehran, Esfahan, Kashan, Shiraz, and the Alborz Industrial City near Qazvin. These five consumption areas utilized over 63 billion cubic feet of gas in 1974. Consumption is expected to rise to almost 140 billion cubic feet in 1977.

### **Other NIOC/NIGC Activities**

NIGC is involved in exploitation directly, through NIOC and through joint ventures. The size of some of their discoveries, such as those at Tang-e-Bijar near Naft-e-Shah and Sarajeh, near Qom have not been announced and no plans have yet been issued for the utilization of these reserves.

**NIOC Overseas Activities.**—In the mid-1970's NIOC greatly expanded its overseas activities. In 1976 NIOC had joint venture interests in three foreign refineries. The Madras Refinery (India) went into operation in 1969. This refinery, which is sup-

plied by crude from an offshore field in Iran, has boosted its original 50,000 bbl/d throughput capacity to 60,000 bbl/d. NIOC also holds an equity in the Madras Fertilizer Company, a petrochemical complex adjacent to the refinery. In 1971, a joint venture refinery with 50,000 bbl/d throughput capacity owned by NIOC, SASOL (South Africa) and TOTAL (France), went into production at Sassolberg in South Africa. The third joint venture is the 50,000 bbl/d refinery in Onsan, South Korea. NIOC is also involved in joint ventures, with British Petroleum for exploration in the North Sea and off the coast of Greenland.

The extension into foreign refineries helps to provide a captive market for Iran's crude exports. Iran's direct export sales rose dramatically during 1975/76. As part of this effort, NIOC has been attempting to join with a foreign company that has a developed distribution and marketing system. In late 1976 Iran was negotiating with the Italian oil company, AGIP, to buy a 50% share of their extensive foreign distribution network.

In other attempts to market crude and ensure supplies of equipment needed for ambitious development programs, Iran was seeking "arms for oil" and "machinery for oil" barter agreements as of early 1977. Negotiations for such arrangements have taken place with, among others, Great Britain, the United States, Italy, and France.

### **TRENDS, PROGRAMS, AND PROJECTS**

Since the nationalization of oil in Iran, the growth in this industry has been astounding, with exploitation of oil expanding at a rapid rate and domestic distribution of oil and oil products being given increasing emphasis. Over 1966–1976, while distribution methods changed from oil tanker trucks to pipelines, NIOC maintained the consumer price of gasoline constant, i.e., 6 Rials (8.5¢ per liter—36¢ per U.S. gallon) for normal grade and 7.5 Rials (10.6¢ per liter—45¢ per U.S. gallon) for super grade. In March 1977 the Government raised gasoline prices to 8 Rials per liter for regular (48¢ per U.S. gallon) and 10 Rials per liter for super (60¢ per U.S. gallon). Moreover, the Government has announced a plan for additional gasoline price increases which would raise domestic gasoline prices to 16 Rials per liter (96¢ per U.S. gallon) for regular and 17.5 Rials per liter (\$1.05 per U.S. gallon) for premium in 1983. The objectives of the price increases are to bring gasoline prices up to international levels for Iranian consumers and to encourage conservation.



Iran has been and will be continuing its search for further reserves of hydrocarbon fuels. In 1976, Iran's recoverable reserves were estimated at 65 billion barrels. To optimize the recovery of petroleum, Iran has granted exploration and exploitation rights to a number of foreign firms with which it has partnership agreements. Under this agreement, NIOC can avail itself of the technology current in other parts of the world where petroleum is being successfully exploited. The 1975 recovery rate of 15-20% is low compared to previous records of Iranian fields and the recovery rate in some neighboring fields. Following the signature of the 1973 sales and purchase agreement, which significantly altered the relationship between NIOC and the Iran Oil Consortium, Iran began exercising much greater influence and control over production, capacity, etc. For example, the NIOC decided to implement a massive secondary recovery program of gas injection. NIOC hopes that this will increase Iran's recoverable reserves to over 130 billion barrels. Under the 1973 sales and purchase agreement, an expansion of total production capacity to 8 million barrels per day was envisaged by 1977/78. However, this goal now appears overly optimistic and current plans call for maintenance of Khuzistan fields' capacity at approximately 6 million bbl/d into the mid-1980's. Planners tentatively expect production to equal domestic consumption about 1993.

The revenues derived from export sales of petroleum are the Iranian economy's source of funds for development expenditures. Iranian planners forecast that the fast rate of economic growth in the mid-1970's will necessitate imports of goods and services of approximately \$40-50 billion per year (constant dollars) by the mid-1980's. They also estimated that oil revenues will provide \$20-30 billion (constant dollars) in foreign exchange to pay for imports in this period.

Iran has long been concerned with the wastage which occurs when natural gas is burned off at the producing oil fields. The Government has continued since 1970 to develop projects for natural gas utilization and for further development and exploitation of its other gas fields. The primary focus through the mid-1980's will be on finding domestic uses for associated gas and on the exploitation of gas fields in areas of the country where they can be used to support industrial and economic development. Announcements by industry officials at the end of 1976 indicated that Iran will try to conserve most of its gas reserves which are not needed for development projects. Several factors were cited in the policy decision. One is the income differential between oil and gas. In October 1976 the Deputy Managing Director of NIOC stated that

The price of gas at consumption points is calculated on the basis of crude oil with equivalent calorific content, but transportation costs of gas are up to 10 times that of crude due to the requirement of capital intensive pipelines and special tankers. Therefore, Iran will increase its exports only when oil sales fall off and at such a time as new uses for gas drive up its price. Iran would not consider any new agreements for the export of its natural gas although present agreements and commitments will be honored.

At that time, NIGC also announced that it was cancelling a major project with a consortium made up of El Paso Natural Gas Company (U.S.) and Sopex and Distrigaz S.A. (Belgium) for the exploitation, liquefactions and export of natural gas. This project would have produced 2,000 to 3,000 million cubic feet of liquid natural gas per day from the Pars gas fields located near the port of Bushehr and would have required a total investment of about \$5.9 billion.

The NIOC has embarked on several pipeline projects to facilitate the transportation of crude oil to domestic refineries, and of petroleum products to distribution centers (see table 9). Some of the projects are:

1. 500 kilometers, 32- by 30-inch crude line including pumping stations from Marum to Esfahan, awarded to Snam-Progetti (Italy).
2. An 18-inch products line and a 20-inch crude line from Esfahan to Tehran, awarded to Houston Contracting Co., subsidiary of Sedco Inc. (U.S.) for \$108 million. The pumping station was awarded to Snam-Progetti.
3. A 16- by 12-inch products line from Tehran to Sari, awarded to a Morrison Knudsen Co. Inc./Neda joint venture. The pumping station was awarded to Spie-Batignolles Cie. (France).
4. Construction of a 18- by 16-inch products line from Tehran to Rasht, awarded to Williams Bros. International Corp. division of United States Filter Corporation (U.S.) and pumping station was awarded to Spie-Batignolles.
5. Construction of a 22-inch products line from Tehran to Shahrud, awarded to Entrepouse (France) for \$72 million with pumping stations awarded to Hood Corporation (U.S.).

6. Construction of a 20-inch line from Shahrud to Mashhad, with branches from Shahrud to Gorgan and from Mashhad to Shahtaghi and Torbat Hiedarieh, was awarded to IRACA-PAC, an Iranian-French joint venture. Pumping stations were awarded to Hood Corporation.
7. Construction of a 12-inch line from Tabriz to Rezaie, awarded to Mothercat Company Ltd. (U.K.) with pumping stations awarded to Spie-Batignolles Cie (France).

Contracts for some 3,000–3,500 housing units required by NIOC's domestic distribution network reportedly have been awarded to Sherkat Gostaresh Maskan (a G.E. affiliate), to the Canadian firm, Star Steel, and to Fabrian-Taker, an Iranian firm affiliated with a French housing company.

A program to build some 6 million cubic meters of new domestic crude and product storage continues. Chicago Bridge and Iron (U.S.) is building over half a million cubic meters of new storage tanks in southern Iran; CMP (France) is building a similar amount in northern Iran; Kobar (Iran) a similar quantity in several locations, mainly near Esfahan and Kerman, and FIDECO (a joint venture between an Iranian public sector company and a French firm), a somewhat smaller amount in scattered locations, mostly in southern Iran. New tenders for storage tanks were expected to be announced in 1977–78.

## Natural Gas Projects

Major areas of gas exploration at present include the offshore reservoir known as Pars Field (formerly

**Table 9.—Iran: Petroleum and Natural Gas Projects**

Name of Project	Agency	Description	Contractor	Cost	Year Awarded	Year of Completion
				(\$ millions)		
Crude and Products Pipeline .....	NIOC	Esfahan-Tehran 365 km. (18" products/20" crude)	Houston Contracting Co., sub. of SEDCO Pumping Stations-Snam Progetti	108	1976	1979
IGAT-II .....	NIGC	Gas pipeline from Pars/EGOCO Fields to Astre 1400 kms Construction Phase	Design Contract Snam-Progetti	30	1976	1978
			N.A.	2,600	1978 (planned)	1982
Products pipeline .....	NIOC	Tehran-Shahrud Pipeline (22")	Entrepose Pumping Stations-Hood Corp.	72	1976	1979
MLS .....	NIOC	Marine LNG Systems and Gas	Moss Rosenberg	600	1976	N.A.
Crude Pipeline .....	NIOC	Liquification Plant. 32"/30" Crude Line from Marun to Esfahan (432 km)	Snam-Progetti Pipeline and Pumping Stations	N.A.	1975	N.A.
Oil Pipeline .....	NIOC	Shahrud-Mashhad 20" Pipeline	IRACAPAC (France) Pumping Stations-Hood Corp.	N.A.	1975	N.A.
Oil Pipeline .....	NIOC	Rezaie-Tabriz 12" Pipeline	Mothercat Co.; Pumping Stations-Spie Batignolles Cie	N.A.	1976	N.A.
Products Pipeline .....	NIOC	Tehran-Sari (16"/12")	Pipeline Morrison-Knudsen Co. Joint venture pumping Station Spie Batignolles	N.A.	1976	1977
Products Pipeline .....	NIOC	Tehran-Rasht (18"/16" Products line	Williams Bros. Intl. Corp.; Pumping Stations-Spie Batignolles Cie	N.A.	1976	N.A.
Sarakhs Gas Treatment Plant .....	NIGC	5 Units 250 m <sup>3</sup> ft per day	Saipem-CIMI-Technipetrol		1976	N.A.
Gas Pipeline .....	NIGC	Neka-Sarakhs 80 km	Butler-Culvern Co.	800	1976	1980
Gas Injection .....	NIOC	Gas Injection of Khuzistan Oil Fields	Various	4,000	1977	1985
Gas Pipeline .....	NIGC	Qeshm-Bandar Abbas	N.A.	N.A.	1978	1982
Oil Storage Facilities .....	NIOC	500,000 m <sup>3</sup>	Chicago Bridge and Iron Company	N.A.	1975	1980
Gas Gathering/NGL Recovery .....	NIOC	Collection, processing delivery of 110,000 bbl/d of NGL from Ahvaz/Marun to Bandar Shapur	Ralph M. Parsons	N.A.	1976	N.A.

Source: U.S. Embassy, Tehran; trade interviews.



called C Structure) and the onshore EGOCO area. Pars Field is located in the Persian Gulf south of Bushehr. The Kalingas consortium (owned 50% by NIGC, 15% each by Crinavas (Spain) and Nissho Co. Ltd. (Japan), 2.5% by Chicago Bridge and Iron Company (U.S.), 7.5% by Haifdan-Ditley Simonsen (Norway) and 5% each by Natural Gas Pipeline Co. and Enserch Co. (both U.S.) has been engaged in development drilling on this structure. Observers believe that Pars Field contains about 65 trillion cubic feet of recoverable natural gas. The EGOCO area, onshore southeast of Pars Field, contains many large structures with good gas prospects. The first three wells drilled, each on a different structure, all proved commercially important.

**Kangan Liquefied Natural Gas Company (Kalingas).**—Development drilling for this project to convert 200 million cubic feet per day of natural gas to liquid natural gas (LNG) for export to Japan and the United States was started during 1976. The project will involve construction of infrastructure, gas gathering and liquefaction facilities. Fluor Corp. (U.S.) will probably carry out the \$1 million feasibility study for the liquefaction facilities. Call for tenders for the construction of facilities could be issued in early 1977, and NIGC hopes that the project will be operational by 1981.

**Sarakhs Gas Project.**—Plans for the second stage of the project to develop the gas fields at Khangiran near Sarakhs were progressing at the end of 1976. This project includes the building of a very large natural gas gathering, treatment, and piping systems. Three Italian companies, Saipem (a member of the ENI Group) CIMI, and Technipetrol are principals in a joint venture responsible for the construction of the sour gas treatment plant consisting of five units, each with a capacity of 250 million cubic feet per day. Three units will be installed initially. Davy Power Gas, Inc. (U.S.), a subsidiary of Davy International Ltd. (U.K.), did the basic design and engineering and is the managing contractor. Construction of the 880-kilometer pipeline, to connect the gas field with a 1,760-megawatt power plant in Neka, was started in 1976 under a contract with Butler-Culvern. The cost of the gas project is estimated at close to \$800 million.

**IGAT II.**—A second pipeline, called the Iran Gas Trunkline II, from the southern gas fields to Astara, will be constructed to deliver 1.6 billion cubic feet per day for export to the Soviet Union for 20 years. This gas will supply the Soviet Union, France, Germany, Austria, and Czechoslovakia under bilateral agreements which are commonly called the tri-

lateral "switch deal." According to these agreements, Iran will supply 1.6 billion cubic feet per day of gas to the Soviet Union and the U.S.S.R. will supply a like (or perhaps slightly smaller) amount of gas to the other participating countries. Additionally, this IGAT II pipeline will carry 1 billion cubic feet per day of gas from the south to various Iranian cities for domestic Iranian consumption.

NIGC has begun planning construction of the 1,400-kilometer, 2.6 billion cubic feet per day pipeline from the EGOCO area to Astara, for the delivery of gas to the U.S.S.R., and for Iranian domestic consumption. NIGC reportedly intends to seek supplier financing for the imported equipment and material used in the pipeline, which has been estimated to cost about \$2.5 billion. This pipeline is scheduled to be completed in 1981 when deliveries of gas under the trilateral deal are scheduled to begin. The design contract for the project was awarded to Snam-Progetti in 1976 for \$30 million; construction contracts will probably be awarded in 1978.

**Gas Injection.**—NIOC has a large-scale program to reinject natural gas to repressure oil reservoirs. OSCO has begun the development of this secondary recovery project, estimated to require an investment of \$4 billion through 1982. It is estimated that gas injection will consume all associated gas now being produced as well as additional nonassociated gas from new fields. This project has the further advantage of saving the gas that Iran cannot immediately utilize and would otherwise have to flare. The gas can be recovered once the oil is depleted, and the present oil fields will become the gas fields of the year 2000. In 1976, gas injection facilities construction for the Gachsaran and Bibi Hakimeh oil reservoirs was awarded to Foster-Wheeler Corp. (U.S.).

NIOC is conducting a drilling program on Qeshm Island to determine more precisely the extent of recoverable gas reserves discovered a few years ago by the Iran Oil Consortium, and to develop them. Reserves are presently estimated at 8 trillion cubic feet. During the Fifth and Sixth Development Plans, NIGC intends to build a system to transmit Qeshm gas to Bandar Abbas, for use in power generating plants and a direct reduction sponge iron plant. Plans call for this system to deliver 800 million cubic feet of gas per day. Contracts for design of part of the system had been let by January 1977.

A future prospect involves a natural gas/condensate discovery by Philips Petroleum of Iran (formerly Coniran) in an area north of Bandar Abbas. The size of this discovery is unknown but

Philips would like to develop it as an LNG export project, provided the Iranian Government agrees.

Other major NIOC gas utilization projects include the following:

1. A gas gathering/NGL recovery system in Ahvaz and Marun Fields, plus a pipeline to Bandar Shahpour to deliver over 110,000 bbl/d of NGL to the Iran-Japan Petrochemical Company. Ralph M. Parsons Company is designing this system and in charge of construction and purchasing for the project.
2. Two plants to remove NGL's and heavy naphtha from 3 billion cubic feet per day of Pazanan dome gas, plus facilities to inject the relatively dry gas into the Gachsaran and Marun oil reservoirs. Reportedly, heavy naphtha from this system will be remixed with crude oil while the NGL (which may amount to over 200,000 bbl/d) was not firmly committed to any user as of late 1976, though part of it will go to the National Petrochemical Company (NPC) for use as petrochemical feedstock. The plants to process Pazanan gas are being designed by Fluor Corporation under a turnkey contract with OSCO, and a substantial portion of the equipment for the project had already been ordered. There had been some slippage in the scheduled completion dates: the plant to provide gas for injection into Gachsaran was due on stream in late 1977, while the plant which will provide injection gas to Marun was to be completed by late 1978.
3. A smaller project to inject dome gas from Naft-Sefid into Haft Kel reservoir had been completed; a project to inject Naft-Sefid dome gas into Paris Field is due for completion in 1978/79.
4. A contract to design and build facilities to reinject about 600 million cubic feet per day of associated gas into Gachsaran reservoir was awarded to Foster-Wheeler.
5. Facilities to reinject 300 million cubic feet per day of associated gas from Bibi Hakimeh and Rag-e-Sefid into Bibi Hakimeh are being designed, part by Foster-Wheeler (compression and injection) and part by Iran Texas Engineering (gas gathering).

While OSCO has made intensive efforts to find new sources of nonassociated gas for the injection program and apparently will be able to use gas from new discoveries outside the Khuzistan fields, OSCO

is still short of gas for the program. Plans call for injection of larger quantities of gas than are yet available into almost every major oil field from specifically identified sources. A large number of wells have been shut due to excessive salt in the crude oil. Consequently, some 50 new desalting projects are in various stages of design and construction.

## GROWTH PROSPECTS

The Fifth Development Plan indicates a total capital investment of \$8.85 billion in the petroleum sector of the Iranian economy. About 90% of this allocation is expected to be spent during the Plan period. This amount is geared to a major expansion for NIOC and its activities, which include:

- A substantial boost in oil production capacity between 1973 and 1978.
- Continued expansion and exploration projects resulting in an increase in the number of oil fields and the use of gas injection to double the amount of recoverable oil.
- Expansion of Kharg Island jetties, to handle 7.2 million barrels per day (bbl/d) for expansion of Iran's export capacity.

This represents a multiple increase over investments during the Fourth Plan period, when Iran's capital expenditures in the petroleum industry totaled \$500 million.

From 1974 to 1976, the OPEC countries maintained a uniform pricing policy and succeeded in commanding substantial increases in the prices of crude petroleum. In December 1976, however, Saudi Arabia and the United Arab Emirates broke with the majority at the group's biannual meeting, and a two-tiered pricing policy came into effect. The net effect of this break in OPEC price solidarity was not clear at the beginning of 1977. Iranian crude oil production dropped initially from 5.9 million bbl/d to just over 5 million bbl/d in response to decreased exports, although production subsequently returned to early 1976 levels at least for the short term. However, Iran could experience a significant decrease in petroleum revenues, if, over the long term, demand for Iranian oil decreases in the face of a continuation of the Saudi Arabian commitment to sustain lower prices through increased production.

Iran is one of the few OPEC countries that has kept up exploration activities as well as increased its production capacity. Exploration activities will continue into the 1980's to confirm the extent of Iran's total oil reserves. Intensified exploration coupled with secondary techniques will be implemented to lengthen the period of Iran's oil export capacity.



If faced with the choice of flaring off gas at the oil field or exporting at 1976 prices, there is little doubt that Iran would prefer to export. However, the requirements for gas that will be created by secondary recovery through gas injection, plus the growing demand for natural gas for internal use, will rapidly reduce the amount of gas not being utilized. Given current and confirmed plans for export plus growth in local demand, Iran will be able to utilize all of its gas production domestically by 1982. Iran's current posture in regard to gas exports compliments OPEC's policy for pricing oil, which Iran was instrumental in creating. Iran will continue to invest heavily in gas exploration. Exploration of the country is far from complete, and new gas reserves will undoubtedly be discovered as more of the country is surveyed.

Heavy investments are slated to be made in internal gas distribution. The large number of projects already approved and implemented for gas delivery to many parts of the country attests to the priority given by the Government to this objective. At the end of 1976, the first stage of the gas distribution system for home and commercial use in Tehran was progressing satisfactorily and similar systems were either being implemented or had been planned.

Iran is also moving rapidly into the development of high energy industries, such as copper, steel, and aluminum refining as well as integration into petrochemicals. These types of industries are viewed as ways of achieving additional value added to gas utilization and most of the country's heavy industry will be gas fed.

Lack of demand has resulted in the exploitation of natural gas lagging well behind that of oil. To make full use of available reserves, Iran will have to make expenditures for gathering, storage, and delivery systems. Authorities estimated that Iran will invest \$6 billion in the natural gas industry in 1976-86. It is highly likely that NIGC will seek foreign loans for a substantial part of this amount.

## CAPITAL GOODS MARKET

Total purchases of capital equipment for petroleum and natural gas extraction and production in Iran grew from \$116 million in 1973 to over \$416 million in 1975 (see table 10). This amount does not include offshore operations, for which no statistics were recorded. Over 65% of this total was spent by the National Iranian Oil Company (NIOC) and its affiliated companies, mainly on pipeline construction and exploration activities. The National Iran Gas Company's (NIGC) exploration, pipeline projects and projects connected with the conversion of homes and industry from oil to piped natural gas

accounted for 15% of all expenditures. These two major industries are expected to require over \$920 million in new equipment in 1980. Over 60% of this 1980 total will be the result of new pipeline investments by NIOC and NIGC. Only one-fourth of all pipe products needed for these projects will be locally produced. Gas injection into oil wells is expected to result in an additional \$4 billion in expenditures in 1977/78. In 1980 this program will account for almost 15% of all expenditures.

## Imports

Total equipment imports grew from \$92 million in 1973 to over \$386 million in 1975, representing an average annual growth rate over 1973-75 of 103%. By 1980 imports are expected to total over \$823 million and to reach the \$1 billion level by 1981.

In 1975 U.S. suppliers led in sales providing over 26.5% of all imports. U.S. suppliers predominated in the sales of petroleum extraction equipment (45.3% of all imports) and pumps, valves and related equipment for the industry (26.9%). Total exports by U.S. supplier firms are expected to remain strong and show an overall growth from \$102 million in 1975 to over \$205 million annually by 1980, representing 24.8% of all imported equipment.

West German supplier firms held 16.5% of the total import equipment market for oil and natural gas related equipment in 1975. Suppliers from the United Kingdom sold almost \$34 million worth of equipment to Iran's oil and natural gas industry in 1975. Over one-half of this total amount was made up of pumps, valves and related equipment used in the gas and oil industry; the remainder was mainly survey and oil well equipment. It is expected that the share of British and German suppliers will remain relatively stable through 1980.

## Domestic Manufacturing

Iranian domestic manufacturers supply some steel pipes to the gas and oil industries. The Ahvaz Rolling Mills in Ahvas, owned by the NIGC is the biggest Iranian producer of large diameter pipes. Shahriar Rolling Mills, also located in Ahvaz, provides approximately 20-30% of all domestically manufactured pipes for the gas and oil industry, and it will double production under an expansion program to be completed in 1978. Test and exploration equipment for the oil and natural gas industries is not produced in Iran except for some workshop manufacturing of basic metering equipment. The Iran Metering Company manufactures approximately 300,000 electric meters per year as well as some metering equipment for gas lines.

**Table 10.—Iran: Size of the Market for Petroleum and Natural Gas Extraction Equipment**  
(thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>GAS/OIL PIPELINE EQUIPMENT</b>					
Domestic Production .....	24,200	22,500	28,000	32,000	80,000
Imports .....					
United States .....	5,742	17,296	30,180	32,692	45,640
Japan .....	7,825	28,590	76,279	—	—
West Germany .....	1,417	5,836	20,022	—	—
France .....	1,483	5,942	13,087	—	—
Italy .....	698	1,851	14,047	—	—
Others .....	1,635	4,207	13,151	—	—
Total .....	18,800	63,722	166,766	96,122	241,190
Exports .....	—	—	300	700	1,000
Total Market .....	43,000	86,222	194,466	127,422	320,190
<b>PETROLEUM EXTRACTION EQUIPMENT</b>					
Domestic Production .....	200	380	700	1,000	12,000
Imports .....					
United States .....	8,798	13,542	37,271	59,400	96,000
West Germany .....	3,670	6,218	12,026	—	—
Italy .....	930	1,263	3,125	—	—
Others .....	5,392	7,770	29,705	—	—
Total .....	18,790	28,793	82,127	112,000	339,000
Exports .....	—	—	—	—	—
Total Market .....	18,990	29,173	82,827	113,000	351,000
<b>OIL AND GAS SURVEY AND METERING EQUIPMENT</b>					
Domestic Production .....	130	440	670	900	2,700
Imports .....					
United States .....	1,981	4,035	7,675	9,730	14,300
West Germany .....	2,753	5,137	7,641	—	—
United Kingdom .....	1,548	3,640	5,429	—	—
Switzerland .....	1,493	2,380	6,595	—	—
Others .....	5,848	4,271	8,727	—	—
Total .....	13,623	19,463	36,067	46,500	61,500
Exports .....	—	—	—	—	—
Total Market .....	13,753	19,903	36,737	47,400	64,200
<b>PUMPS, VALVES, AND RELATED EQUIPMENT</b>					
Domestic Production .....	320	470	900	1,500	2,300
Imports .....					
United States .....	11,724	16,645	27,273	35,100	49,200
United Kingdom .....	6,677	7,216	18,193	—	—
West Germany .....	9,845	18,577	24,115	—	—
Japan .....	1,106	3,240	9,346	—	—
Others .....	11,462	18,813	22,263	—	—
Total .....	40,814	64,491	101,190	130,000	182,000
Exports .....	—	—	—	—	—
Total Market .....	41,134	64,961	102,090	131,500	184,300
<b>TOTAL MARKET: PETROLEUM AND NATURAL GAS EQUIPMENT</b>					
Domestic Production .....	24,850	23,700	30,270	35,400	97,000
Imports .....					
United States .....	28,245	51,518	102,399	136,922	205,140
West Germany .....	17,685	35,768	63,804	—	—
United Kingdom .....	9,589	16,013	33,994	—	—
France .....	2,783	7,742	15,387	—	—
Others .....	33,725	65,428	170,566	—	—
Total .....	92,027	176,469	386,150	384,622	823,690
Exports .....	—	—	—	—	—
Total Market .....	116,877	200,259	416,420	420,022	920,690

<sup>1</sup> Estimates.

Source: United Nations, Organization for Economic Cooperation and Development, supplier country and official Iranian trade statistics; estimates based on trade interviews.

## MARKET OPPORTUNITIES

Government decisions to invest heavily in oil and gas exploitation have created excellent opportunities for sales of nearly all industry-related equipment. A considerable portion of this equipment will be used

in construction of pipelines and for gas injection to permit secondary recovery in existing oil fields.

**Oil Well Drilling Equipment.**—NIOC has over 620 producing wells and is now carrying out a 10-year exploration program which was begun in 1973. This exploration program includes the mapping of



potential deposits and has created new sales opportunities for test drilling equipment, rock sampling equipment, on-and-offshore drilling rigs and platforms, as well as power equipment, blowout valves, mud pumps, "Christmas trees" and other standard rig equipment.

**Natural Gas Equipment.**—Under the first phase of an 8-year construction program by Sofregas (France), 40,000 homes in Tehran were to receive directly piped natural gas during 1976. This program is being expanded in the next phase to include 240,000 homes by 1978. Equipment such as gas valves, pipes, and gas metering equipment for pipelines, residential use and industry use is required. Equipment to convert coal and oil burning power plants to natural gas will also be required. High capacity gas compressors, metering and safety equipment will be used in large numbers for NIOC's gas injection program, as well as other programs to develop and transport natural gas. Gas turbines for power generation at production sites and for other uses will be required in large numbers.

**Other Equipment.**—All types of metering and control equipment for oil and gas lines will be purchased during 1976–80. Instrumentation for oil and chemical analysis will also be in strong demand as well as rock- and soil-testing equipment.

**Services.**—NIOC, NIGC, the operating companies of Iran Participants Limited, and the joint ventures will continue to utilize a wide variety of consulting and technical services in exploration, drilling and production. Specialized technical and engineering capabilities will also be required for exploration, development of secondary recovery, construction of new storage and distribution facilities, as well as exploitation of natural gas.

## MARKETING ENVIRONMENT

### Buyers' Universe

Only a limited number of purchasers exist in the Iranian oil and gas industries. While NIOC is the major purchaser, the 12 operating companies of Iran Oil Participants Limited (IOP) normally purchase on behalf of NIOC through the Iran Oil Service Company (IROS Co.), which has its offices in London.

NIOC also has its own overseas purchasing offices located at the following addresses:

National Iranian Oil Company  
132/5 Sloane Street,  
London S.Y.1,  
England.

National Iranian Oil Company  
Time Life Building  
New York, N. Y.  
U.S.A.

Service contractors to NIOC and NIGC normally purchase their equipment directly from foreign suppliers rather than through supplier representatives in Iran. Much of the equipment and expendable supplies purchased by NIOC is obtained through international tenders at their London and New York offices. NIGC issues international tenders through the Foreign Transactions Company in Tehran. These tender notices are distributed to selected lists of suppliers worldwide. Most contracts for projects in both the oil and natural gas industries have been turnkey in nature, but late 1976 saw movement toward a policy of awarding different contracts for engineering and construction.

Technical consultants play an important role in the petroleum and natural gas industries. NIOC relies heavily on IOP for technical services. For oil pipeline construction, international companies specializing in this work are normally used as prime contractors. The National Iranian Gas Company also makes extensive use of foreign consulting and technical services. For example, Sofregaz, the French Government consulting firm, performed all technical consulting work for the gas pipeline in Tehran. Several U.S. and European consulting and engineering firms have associated themselves with Iranian companies in developing business and handling projects.

### Foreign Suppliers' Universe

The major supplier of diesel generators for the Iranian petroleum and gas drilling market is Caterpillar Tractor Co. (U.S.). Solar Division of International Harvester Corp. (U.S.) is a leading supplier of gas turbines. Ruston Ltd. (U.K.) supplies large gas compressors. Studebaker-Worthington Inc. (U.S.) supplies ½- to 15-horsepower compressors to NIGC. Another supplier of compressors in this range is Joy Manufacturing Co. (U.S.) which supplies to the natural gas industry. Metering equipment for both the oil and gas industries is supplied mainly by the Foxboro Company (U.S.) and Johnson Williams Company (U.K.)

Drawworks from National Supply Company (U.K.), division of Armco Steel Corp. (U.S.), have found a good market. National Supply Co. is also a major supplier of mud pumps and valves, while Champion Chemicals (U.S.) is a major supplier of production chemicals to the oil industry. Dresser Magcobar, division of Dresser Industries, Inc. (U.S.) is also a major supplier of mud pumps. Another supplier of drawworks to the market is Amesco Ltd.,

division of Westburne International Industries Ltd. (Canada).

Valves are supplied by Cameron Iron Works Inc. (U.S.) which also sells blowout preventers. Blowout preventers are also supplied by Atlas-Stuart-Stevenson Co. (U.S.). Drilco Services Ltd. (Canada), division of Smith International Inc. (U.S.), is the major supplier of petroleum drilling tools. This firm's parent company, Smith International, is also strong in sales of drill bits, along with Hughes Tool Co. (U.S.).

Major suppliers of jack systems are Marathon Letourneau Offshore Pte. Ltd. (Singapore), a division of Marathon Manufacturing Co. (U.S.) and IMCO Services B.V. (Netherlands), a division of Halliburton Co. (U.S.). The major "watermaker" supplier is Atlas-Stuart-Stevenson Co. (U.S.) Offshore drilling rigs are procured from shipbuilding firms located mainly in Singapore and West Germany.

## Marketing Factors

Because most petroleum industry equipment is procured from major international suppliers, few agents and distributors of this equipment are located in Iran. However, many supplier firms use local

representatives to maintain industry contacts and obtain market intelligence. Technical considerations are the real purchasing criteria for both NIGC and NIOC. Price, while important, is not as critical as technical specifications and safety standards. All imports of equipment for both NIOC and NIGC are exempted from customs duties.

Promotion of equipment for sale to NIOC and NIGC can be made directly at their offices in Tehran. Most firms supplying this industry rely heavily on international advertising to sell their products in Iran.

## COMPETITIVE POSITION OF U.S. SUPPLIERS

Major U.S. operating and service firms, as well as suppliers of petroleum industry equipment are active in Iran, and have established a leading position in the industry. The large Iranian investment in secondary recovery, natural gas exploitation, and continued expansion of exploration, production, and distribution are expected to result in the maintenance of this leading position in the industry by U.S. firms, and they should continue to provide new opportunities for sales of equipment and services.

### *National Iranian Oil Company Affiliates*

Company	Owners	Share (in percentages)
<b>WHOLLY OWNED SUBSIDIARIES IN IRAN</b>		
National Petrochemical Company .....	NIOC	100
National Iranian Tanker Company .....	NIOC	100
National Iranian Gas Company .....	NIOC	100
Ahvaz Pipe Mills .....	NIOC	100
<b>WHOLLY OWNED SUBSIDIARIES OVERSEAS</b>		
Iranian Oil Company Limited .....	NIOC	100
Iranian International Oil Company .....	NIOC	100
<b>JOINT VENTURES IN IRAN</b>		
SIRIP (Societe Irano-Italienne des Petroles) (Agreement effective from August 27, 1957)	NIOC	50
	AGIP (Italy)	50
IPAC (Iran Pan American Oil Company) (Agreement effective from June 5, 1958)	NIOC	50
	Amoco Iran Oil Company (Subsidiary of Standard Oil Co. (Indiana) (U.S.))	50
IMINOCO (Iranian Marine International Oil Co.) (Agreement effective from February 13, 1965)	NIOC	50
	AGIP (Italy)	16 <sup>2</sup> / <sub>3</sub>
	Phillips Petroleum Co. (U.S.)	16 <sup>2</sup> / <sub>3</sub>
	Oil & Natural Gas Commission of India	16 <sup>2</sup> / <sub>3</sub>
LAPCO (Lavan Petroleum Co.) (Agreement effective from February 13, 1965)	NIOC	50
	Atlantic Richfield Co. (U.S.)	12 <sup>1</sup> / <sub>2</sub>
	Murphy Oil Corp. (U.S.)	12 <sup>1</sup> / <sub>2</sub>
	Sun Oil Co. (U.S.)	12 <sup>1</sup> / <sub>2</sub>
	Union Oil of California (U.S.)	12 <sup>1</sup> / <sub>2</sub>
INPECO (Iran Nippon Petroleum Co.) (Agreement effective from January 5, 1972)	NIOC	50
	IRAPEC (Owned by Teijin Ltd. (Japan), North Sumatra Oil Development Corp. and other firms)	33 <sup>1</sup> / <sub>3</sub>
	Mobil Oil Corp. (U.S.)	16 <sup>2</sup> / <sub>3</sub>
HOPECO (Hormoz Petroleum Co.) (Agreement effective from January 5, 1972)	NIOC	50
	Petrobras (Brazil)	25
	Mobil Oil Corp. (U.S.)	25



**List of National Iranian Oil Company & Affiliates—Continued**

Company	Owners	Share (in percentages)
<b>JOINT VENTURES OVERSEAS</b>		
North Sea Exploration .....	NIOC	50
	British Petroleum Co. Ltd. (U.K.)	50
Off Shore Exploration West of Greenland .....	NIOC	30
	British Petroleum Co. Ltd. (U.K.)	NA
	Standard Oil Co. of California (U.S.)	NA
	SAGA	NA
Madras Refinery—India .....	NIOC	13
	Standard Oil Co. (Indiana) (U.S.)	13
	Government of India	74
South African Refinery .....	NIOC	17½
	SASOL	NA
	TOTAL (Societe Francaise des Petroles BP S.A.) (France)	NA
Madras Fertilizer Company .....	NIOC	24½
	Government of India	75½
South Korea Refinery .....	NIOC	50
	Sang Yang Company	50
<b>SERVICE CONTRACTORS TO NIOC</b>		
SOFIRAN (Contract effective December 13, 1966) .....	Enterprise de Reserches et d'Activities Petrolieres (ERAP) (France)	40
	Mitsubishi Oil Development Co. (Japan)	40
	Societe Nationale de Petroles d'Aquitaine (France)	20
EGOCO (European Group of Oil Companies) (Contract effective from June 26, 1969)	ERAP (France)	32
	AGIP (Italy)	28
	Hispanica de Petroleos S.A. (Hispanoil) (Spain)	20
	Petrofina S.A. (Belgium)	15
	Österreichische Mineraloeverwaltung AG. (O.M.V.) (Austria)	5
PHILIRAN (Phillips Oil Company of Iran) (Formerly CONIRAN, with Continental Oil as operator)	Phillips Petroleum Company (U.S.)	50
Contract effective from September 29, 1969, Phillips took over as operator in late 1973 after its purchase of 50% of CONIRAN was approved by Parliament.	Continental Oil Company (U.S.)	25
	Cities Services Co. (U.S.)	25
Oil Services Company of Iran (Private Company) .....	Owned by Iranian Oil Participants Limited which in turn is owned as follows:	
	British Petroleum Co. Ltd. (U.K.)	40
	Royal Dutch Petroleum Co. (Netherlands)	14
	Campaigne Francaise des Petroles (CFP) (France)	6
	Exxon Corp. (U.S.)	7
	Gulf Oil Corp. (U.S.)	
	Mobil Oil Corp. (U.S.)	7
	Standard Oil Co. of California (U.S.)	7
	Texaco Inc. (U.S.)	7
	Tricon Agency Limited consisting of:	
	Atlantic Richfield Company (U.S.)	1½
	Amer. Independent Oil Co. (U.S.)	5%
	Getty Oil Co. (U.S.)	5%
	Charter Oil Co. (U.S.)	5%
	Continental Oil Co. (U.S.)	5½
	Standard Oil Co. (Ohio) (U.S.)	5½
TOTAL—Iran (Contract signed July 27, 1974) .....	CFP (France)	100
Dioco Deminex Iran Oil Company (Two contracts, one each for Abadan and Shiraz signed July 30, 1974)	Deutsche Erdversorgungs GmbH (Germany) (Deminex)	100
Ultramar-Iran Oil Company (Contract signed August 7, 1974) .....	American Ultramar Limited (Wholly owned by Ultramar Co. Ltd. of U.K.)	100
Lar Exploration Company (LAREX) (Contract signed August 20, 1974)	Ashland Oil Inc. (U.S.)	NA
	Pan Canadian Petroleum Ltd., division of Canadian Pacific Ltd. (Canada)	NA
AGIP Iran Petroleum Company .....	AGIP (Italy)	100
Iranian Oil Services Limited .....	A. U.K.-based Company	100

Source: National Iranian Oil Company.

# Printing and Publishing

THROUGH THE early 1980's the highest growth areas in the Iranian printing and publishing industry will be the printing of textbooks and government material, as well as commercial and packaging printing. Despite increased demand for published materials during the early 1970's and an ambitious national educational program to increase the literacy of the Iranian population many printing and publishing firms closed. The country's publishers and printers were adversely affected by rising material and labor costs, skilled manpower shortages, and changes in government policy. The Government finally recognized the importance of the industry and in 1976 began to divert increasing amounts of public funds to printing and publishing in the form of investment credit. At the same time it encouraged foreign firms to participate in upgrading the industry.

The major trend in the industry is toward consolidation and modernization. With a projected average annual growth rate of nearly 25% in capital investment during the 1976-80 period, the printing and publishing industry is expected to specialize increasingly in such areas as packaging and color printing. While the future of book, magazine, and newspaper publishers will depend to a large extent on a loosening of government controls, by 1976 the industry was showing a slow recovery from problems experienced during the 1974-75 period.

The Iranian market for printing and graphic arts equipment is expected to total \$23 million by 1980. A particularly good market for prepress and bindery and finishing equipment are anticipated. Demand is rising for higher speed pressroom equipment, but most purchases will continue to be of small to medium capacity machinery. Total Iranian sales of printing and publishing equipment more than doubled in 1975 when major purchases of large web presses were made. Although large fluctuations are expected from year to year, the anticipated average annual growth rate of printing and graphic arts equipment sales in Iran is expected to be about 19% during the 1975-80 period.

## STRUCTURE AND SIZE

In 1976 a total of 833 printing firms and 60 publishers were registered with the Ministry of Informa-

tion. Of these, 69 printing firms were directly owned by the Government. Publishing is still very much in its infancy in Iran. Many firms which classify themselves as publishers are little more than basic printing operations.

The strongest growth areas during the years 1970 to 1975 were textbook and government printing (see table 1). The total number of textbooks printed annually increased from 30.6 million in 1970 to 50 million in 1975. Government printing of pamphlets showed a similar increase, up from 34.5 million in 1970 to 60.3 million in 1975.

During the same period, however, there was a marked drop in the number of newspapers and trade books (nontextbooks) published. Although newspaper circulation was up from 975,000 in 1970 to 1.1 million in 1975, the total number of daily newspapers declined from 34 to 16. The number of book titles published in Iran fell similarly from 4,359 in 1970 to 1,800 in 1975.

Iran's publishing and printing industry is concentrated in four major areas: Government printing, commercial and package printing, newspaper and periodical printing, and book printing and publishing (see table 2).

## Government Printing

In 1975 there were 69 in-house government printing plants, many of which were used exclusively for printing booklets, pamphlets, and government forms. The majority of the Government-owned plants are small with only one or two presses and perhaps some binding and finishing equipment. The largest user of printed matter is the Ministry of Education. It ordered 50 million textbooks for the education system in 1975. Much of the Ministry's needs have been met by private printing plants in Tehran, the S.S. Offset Company and the 25th of Shahrivar Printing House. Some large printing facilities associated with government organizations are the Bank Melli Press, the Ministry of Information Press, and the Iranian Parliament Press. The larger universities in Iran also have their own printing and publishing departments. The Tehran University Press and Aryamehr University Press are examples of active university press operations. The National Iranian



**Table 1.—Iran: Development of the Printing and Publishing Industry**

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>TITLES PUBLISHED</b>						
Daily Newspapers .....	34	39	NA	16	18	25
News Reviews (Weekly) .....	71	68	NA	17	17	23
Weekly Magazines .....	30	32	NA	16	20	25
Monthly Magazines .....	50	56	NA	28	30	45
Trade Books .....	4,359	NA	NA	1,800	1,950	2,800
<b>VOLUME OF PRINTING</b> (thousands of copies)						
Daily Newspapers (circ.) .....	975	1,000	1,375	1,100	1,200	1,800
Government Pamphlets (copies annually) .....	34,500	47,500	52,900	60,300	68,000	110,000
Trade Books (copies annually) .....	5,300	5,260	4,100	NA	4,600	6,600
Textbooks (copies annually) .....	30,600	36,000	42,000	50,000	56,000	85,000
<b>ESTABLISHMENTS</b>						
Printing Units .....	132	375	NA	830	950	1,452
Publishing Units .....	122	127	NA	60	64	81
<b>CAPITAL EXPENDITURES</b> (millions of U.S. Dollars) .....						
	13.5	18.0	19.6	48.2	27.7	63.5

<sup>1</sup> Estimates.

Source: Ministry of Information and trade interviews.

**Table 2.—Iran: Major Printers and Publishers**

Organization	Production
<b>GOVERNMENT</b>	
Bank Melli Press .....	Commercial printing for the banking industry, banking journals and reports
Ministry of Information Press .....	Books, periodicals
Iranian Parliament Press .....	Official gazette and other government printing
Tehran University Press .....	Books, journals
Aryamehr University Press .....	Books, journals
National Iranian Oil Company .....	Commercial color printers, books, pamphlets
<b>COMMERCIAL</b>	
25th of Shahrivar Printing House ...	Books
Sepehr Printing House .....	Books and commercial printing
Offset Co. ....	Books, periodicals, commercial printing
Rokh Printing House .....	Commercial color printing
Dad Printing House .....	Commercial color printing
<b>PACKAGING</b>	
Container Corporation of Iran .....	Metal and carton printing
Iran Carton Company .....	Metal and carton printing
The Automat Printing Company ....	Labels and boxes
<b>NEWSPAPERS AND PERIODICALS</b>	
Etella'at Newspapers .....	Persian and Latin script newspapers and periodicals
Kayhan Group .....	Persian and Latin script newspapers, periodicals, and books
Khorasan Newspaper Company ....	Newspaper and books
Alik Company .....	Newspaper
The Economist Press .....	Persian and English language economic journals and financial printing for banks
<b>BOOK PUBLISHERS</b>	
Amir Kabir Publishers .....	Trade books and textbooks
Pars Publishing House .....	Trade books and commercial printing

Source: Trade interviews.

Oil Company also operates its own printing facilities.

**Bank Melli Press.**—The printing shop of Bank Melli Iran (Iran's largest commercial Bank) provides a number of Iranian banks with a large portion of their printed material requirements, including circulars, and stationery. With a staff of 280, the Bank Melli Press publishes the monthly Bank Melli Magazine and the quarterly Journal of the Central Bank of Iran. During 1974–76 Bank Melli modernized its printshop, acquiring Monophoto prepress equipment from Monotype Corp. Ltd. of Britain and Heidelberger presses from Heidelberger Druckmaschinen A.G. of West Germany. As part of its modernization program, Bank Melli has been replacing its letterpress equipment with offset equipment.

**Tehran University Publishing and Printing Department.**—Set up in 1946 with a staff of 130, this organization prints 220,000 copies of textbooks annually; a weekly university newspaper with a circulation of 1,000; and various university department magazines and journals with normal pressruns of 1,000 copies. The department's equipment includes letterpresses from various German suppliers and both Japanese and British offset presses. In the late 1970's the department's book printing output is expected to grow from 220,000 copies to 500,000 copies annually.

**The National Iranian Oil Company (NIOC).**—With a number of printing facilities located around the country, NIOC has managed to build up a reputation for high quality color printing which is rare in Iran. This reputation is maintained by the numerous journals, oil industry books, posters, and calendars produced by the company's public relations

office. A good indication of the company's printing activities can be seen in the printing and distribution record of such NIOC monthly publications as *Oil News*, *Iran Petrol*, and *Iran Oil Journal*—up from a total monthly circulation of 3,000 in 1970 to 36,000 in 1975.

Many in-house government printing shops are small, meeting only the needs of their particular agencies. Special printing, particularly advanced color printing, is therefore often contracted either to another government organization with appropriate printing facilities or to a private printing firm. Many printing firms throughout the country are engaged full time in meeting the requirements of government offices. Among these, the most important are the 25th of Shahrivar Printing House and Sepehr Printing House.

Described as one of the largest and best designed printing facilities in the Middle East, the 25th of Shahrivar Printing House which employed 500 people in 1976 is owned by the Offset Co. Offset was established in 1955 by Franklin Books Iran (the local affiliate of the U.S. nonprofit organization) and the Imperial Organization for Social Services. The Offset printing plant was opened in 1957 with an original capacity of 20 million 192-page books per year. In 1975, the 25th of Shahrivar Printing House was established in a suburban area in order to take some of the workload off the company's smaller presses in downtown Tehran and to raise capacity by an additional 55 million books per year. By early 1976 two of the new plant's five large web offset presses, purchased from the George Hantscho Co. Inc. of the United States, were in operation. This company plans to add additional capacity at its suburban location by 1979 to bring total output close to 125 million books annually.

Government work makes up the majority of the Offset Company and 25th of Shahrivar's printing. In addition to printing several government newspapers and periodicals, these firms in 1976 printed all 50 million primary and secondary school textbooks for the Ministry of Education. Offset Company also handles some work for the private sector, such as book printing for the Franklin Press and the Amir Kabir Publishing House.

**Sepehr Printing House.**—This firm was founded in 1933 and is one of the oldest printing plants in Tehran. In 1976 Sepehr supplied the Ministry of Education and universities with 5 million textbooks. Sepehr also prints 2 million volumes of trade books each year and a daily average of 30,000 pages of miscellaneous printed material. Sepehr began modernizing its shop in 1966, and almost all equipment in operation in 1976 had been purchased gradually since then. Sepehr's prepress equipment is from both Monotype of Britain and Klimesch and Co. of West

Germany, with its pressroom equipment including letterpresses from Heidelberg and offset presses from Roland Offset AG. (both of West Germany). Finishing equipment has been supplied by Switzerland's Mueller Martini AG. and A. Kolbus of West Germany. Sepehr does not plan to expand in the foreseeable future, chiefly because such a program would entail an expensive change of location.

## **Commercial Printing and Printing for Packaging**

Thanks largely to the huge demand for consumer goods, particularly prepackaged and canned foodstuffs, the early 1970's saw printing and packaging emerge as one of the most rapidly expanding areas of Iran's printing and publishing industry. Commercial printers initially benefited from the increased demand for printing for packaging.

Commercial printing is mainly in the hands of the country's older and smaller private printing shops. In addition to handling the general printing needs of business for forms, calling cards and stationery, many shops also print labels and containers for packaging. Although the printing of high quality four-color advertising copy is relatively new in Iran, several firms successfully entered this field in the mid-1970's. Demand is rising rapidly for high-quality printing of posters, postcards, advertising circulars, and books. By 1976 such specialty work was being done by Iranian printers, principally Rokh Printing House and Dad Printing House.

A new type of firm in Iran is the large-scale specialized packaging company, such as the Container Corporation of Iran and the Iran Carton Company. Both of these firms are fully equipped with modern machinery to handle their printing needs. Container Corporation is able to print directly on cans and cardboard cartons. There are also increasing numbers of packaging and package printing lines operated by the larger industrial and consumer goods producers.

The Automat Printing Company, established in 1965, is one of the new firms which specializes in printing for packaging. Production levels for 1975 were 480,000 pages of labels and 500,000 boxes per day. Automat runs four Heidelberg letterpresses and one Roland offset press, together with a Jagenberg Werke AG. (West German) glue machines and a Wohlenberg & Co. (West German) cutting machine. An additional Heidelberg press was ordered in 1976 to meet the mounting demand for the company's services.

## **Newspapers and Periodicals**

The printing of newspapers and periodicals is dominated by two large publishing groups, Etella't



Newspapers and the Kayhan Group. A third group, which should expand rapidly in the future is the publishing arm of the recently formed Rastakhiz party (Iran's only legal political party). Sixteen daily newspapers were published in 1975 with an estimated total circulation of 1.1 million. Of these, 10 dailies were published in Tehran. The largest daily, Ettela'at, has nationwide circulation of 250,000. Other Tehran-based daily newspapers, and the six dailies published in the provinces, have primarily local circulations. In mid-1976, there were four foreign language newspapers, two English, one French, and one Armenian. In addition to the above, 18 weekly news reviews and 18 weekly and 28 monthly magazines were published during that same year (see table 3).

**Ettela'at Newspapers.**—Founded in 1920 by the young photographer/reporter Abbas Massoudi, the Ettela'at group has grown steadily to include three daily newspaper: Ettela'at, Persian-language (cir. 250,000), Tehran Journal, English-language (cir. 45,000), and the Journal de Tehran, French-language (cir. 30,000). Weekly publications include the Arabic-language Alkha (cir. 45,000), the German-language Die Post and five Persian-language magazines specializing in sports, news reviews, women's affairs, and youth interests. Ettela'at also compiles and prints an annual yearbook.

All Ettela'at publications are printed in the company's own print shop which is staffed by 550 employees. Almost all of the equipment has been purchased since 1962. Prepress equipment includes a computerized Linotron 505 C unit supplied 2 years ago by Linotype-Paul Limited (U.K.) with seven keyboard units and two edit readers. Ettela'at plans to continue modernizing its printing facilities, increase the circulation of its publications, and negotiate for the printing of Rastakhiz Party periodicals.

**Kayhan Group.**—Founded in 1942, Kayhan publishes a wide variety of newspapers, periodicals, and specialized publications. Among these are three daily newspapers: Kayhan, Persian-language (cir. 300,000); Kayhan International, English-language (cir. 100,000); and an airmail edition of the English-language newspaper with a circulation of 60,000. Three popular weekly magazines with a combined circulation of 420,000 copies are produced as well. Kayhan's activities also include the compilation of numerous economic studies and the publication of government documents, such as annual budgets and summaries of national development plans. Kayhan plans to continue modernizing its existing plant, which has a staff of 600 and a computerized prepress facility with a British-made Linotron 303 machine.

**Khorasan Newspaper Company.**—This firm publishes Khorosan, a Persian-language daily and one

*Table 3.—Iran: Major Newspapers and Periodicals*

	Proprietor	Character	Address
<b>DAILY NEWSPAPERS</b>			
Kayhan .....	Dr. M. Mesbahzadeh	Political & Social	Ferdowsi Ave. Tehran
Ettela'at .....	Farhad Masudi	Political & Social	Khayyam Ave. Tehran
Rastakhiz .....		Rastakhiz Party	N. Villa Ave. Tehran
<b>WEEKLY MAGAZINES</b>			
Donyaye Varzesgh .....	M. Fazaneh	Sports	Khayyam Ave. Ettela'at Bldg. Tehran
Kayhane Varzesghi .....	M. Monsefi	Sports	Ferdowsi Ave. Tehran
Zane Ruz .....	Dr. Tahbaz	Women	Ferdowsi Ave. Kayham Bldg. Tehran
<b>MONTHLY MAGAZINES</b>			
Daneshmand .....	Mrs. Amidi-Nuri	Scientific	Ebn-Sina Ave. Tehran
Negvin .....	Dr. Enayat	Literature	Pahlavi Ave. Adl St., Tehran
Sokhan .....	Dr. Khaniari	Literature	Hafez Ave. Tehran
<b>REPRESENTATIVE MAGAZINES ISSUED BY GOVERNMENT ORGANIZATIONS</b>			
Bank Markazi .....		Central Bank	
Honar-o-Mardom .....		Ministry of Art & Culture	
Ruzname Rasmi Keshvare Shahanshahi .....		Ministry of Justice	

Source: Trade sources.

of the country's leading medium-sized newspapers. It was established in 1949. Khorasan plans to double its 1975 circulation to 50,000 by 1978. In addition to the daily newspaper, Khorasan also prints books under contract to private publishers and government agencies. It is located in Tehran and has a staff of 100. The Khorasan plant has eight Heidelberg letterpresses and six stitching machines from West Germany. Plans for updating the finishing department include the addition of new folding and bookbinding equipment.

**Alik Company.**—It was founded in 1930, and publishes the daily Armenian-language newspaper Alik (cir. 12,000). The printing operation is relatively small, employing 31 people and using two Linotype typesetters in the prepress section, a Heidelberg press and a Wohlenberg cutter in the finishing department. An additional Linotype-Paul Limited typesetter was ordered in 1976.

**The Economist Press.**—Established in 1955, this firm publishes Persian-language and English editions of its weekly magazine, *The Tehran Economist*. Circulation is 15,000 and 5,000 respectively. The Economist Press also does some commercial printing for banks on a contract basis. The print shop is small, equipped only with two Harris-Intertype Corp. (U.S.) typesetting units, two Heidelberg presses and one Solna Offset AB. (Sweden) printing press. Purchasing plans in 1976 included additional typesetting and bookbinding equipment.

## Book Printing and Publishing

In 1975, Iran's book publishers printed 50 million textbooks and 2.2 million trade books. The number of printed textbooks grew 11% per year during 1970–75 while the number of trade books printed decreased by almost 60%. Over 4,300 book titles were published in 1970. This figure declined to only 1,800 new titles during 1975. In 1976 there were 60 publishing houses in Iran, only half the number existing in 1970.

**Amir Kabir Publishers.**—Amir Kabir was founded in 1950. It is one of Iran's largest and most aggressive publishing houses and one of the few firms to deal exclusively in book publishing. In 1975 Amir Kabir distributed 500,000 copies of its publications, many through its own retail bookstores. During the same year this firm also purchased Ketabhaye Jibi, Iran's largest publisher and distributor of paperback books. In early 1976 Amir Kabir purchased an interest in a second firm, Khwarazmi Publishing House, a highly reputable publisher of academic translations and textbooks. These firms will continue to distribute under their original names which have acquired a considerable following in the market

place. Through these acquisitions Amir Kabir has maintained its position as a publishing industry leader. Amir Kabir contracts its printing to a number of Tehran-based firms.

**Pars Printing House.**—This firm was established in 1946 and prints both books (3,000 volumes monthly) and miscellaneous materials (7,000 pages daily). The printing plant is located in downtown Tehran and employs 10 people. Typesetting is done by hand. Its equipment includes five Heidelberg presses, one Roland offset press, and one bookbinding unit from Pivano & S.p.A. (Italy).

## Government Agencies

The printing and publishing industry is overseen by the Government primarily through the Ministry of Information located on Shahreza Avenue, Kakh Crossing, Tehran, Iran. The Ministry licenses all publishers and screens applicants for licenses. All publications must be approved and principal licensees must be members of the Rastakhiz Party. The Government's policy is to issue new permits only to large printing houses equipped with advanced, automatic printing equipment.

The Ministry of Art and Culture reviews and registers all privately published material. Copy must be submitted in page proof or equivalent form, and resubmitted incorporating any required changes for final approval. The cost involved in this process is considered one of the major reasons for the sharp drop in the publications of new book titles in recent years.

## TRENDS, PROGRAMS, AND PROJECTS

Newspaper publishing in Iran began in the first half of the 19th century with an official gazette. It was not until the turn of the century and the emergence of private publications that Iran developed a national press in the modern sense. The relaxed political atmosphere of the 1930's encouraged an increase in the number of newspapers and magazines, which rose to 194 by the end of the decade. In 1941, the Government passed a press law (amended in 1943, 1952, 1955, and 1963) to regulate the issuance of licenses. Further Government controls were added in 1975 when a large number of magazines and newspapers were required to terminate operations. In May of that year all Iranian press proprietors' and journalists' associations were affiliated with the Rastakhiz Party.

Beginning in the early 1970's, government publications and the few large newspapers enjoyed high circulations. However, the growing literacy of the population has not yet given rise to a commensurate



increase in the production of other printed matter. The number of new book titles in print each year rose steadily during the last decade from 800 in 1960 to 4,359 in 1970. Since that time the trend has been in the opposite direction. In 1975 only 2.2 million copies of 1,800 titles appeared, compared with 5.3 million copies in 1970.

The Government indicated concern regarding the decline in book publishing. Throughout 1975 and 1976, there were numerous newspaper editorials and articles concerning this decrease in publications—a decrease made even more noticable by the recent progress in the literacy program. The reorganization of the press in 1975 and the controls imposed on book publishing have certainly contributed to the decreased output. In addition, book publishers with a few exceptions such as Amir Kabir and Ebn-Sina were typically very small operations up to 1975. Rising costs of labor and paper and the relatively limited editions of books in Iran have created a very difficult situation for smaller publishers. For example, the cost of printing one book page jumped from approximately \$10 in 1974 to \$15 in 1976.

During the 1973 to 1976 period there were often paper shortages. The average cost of paper rose 85%, with most of the increase occurring in 1974 and early 1975. Cost of labor in the industry also advanced by nearly 50% during the same period. This inflation has all but wiped out profits for many firms, particularly some of the smaller publishers. The publishing manager of Amir Kabir estimated that the direct costs of printing a book doubled in the period 1973–76. Publishers also found it difficult to obtain bank financing for working capital and equipment purchases. According to industry sources, banks do not recognize books as real commodities and, therefore, are reluctant to extend credit to the industry. A trend toward consolidation in the industry appears to be developing in response to these problems. Larger firms are expanding at the expense of smaller, less profitable operations.

An overcapacity of pressroom facilities operating in the country developed in 1973–75 period; however, the typical print shop in Iran has critical bottlenecks in both the prepress and finishing and binding operations. These problems are particularly noticeable at two peak seasons. One falls just prior to the Iranian New Year (March 21), when there is a heavy demand for calendars, New Year's cards, and other annual publications. The second comes in mid-summer and occurs because textbooks for the coming year are typically not given final approval until 2 to 3 months before the term begins in October. These bottlenecks, plus the shortage of labor and rising wages have created an increasing need for efficient, laborsaving equipment, particularly for the prepress and finishing processes.

Although large printers often have mechanical

binding equipment, most binding is done by hand. Binding is clearly becoming one of the most serious obstacles to increased book and pamphlet production. Many small printing plants and government printing shops have no binding equipment at all. In 1976, there were some 100 shops in Tehran specializing in providing bookbinding services. These shops typically had three or four employees working by hand, and since the volume of work has risen sharply, there was a backlog of orders and books are often poorly bound.

The publishing industry has not developed modern marketing techniques, and the Iranian public has not acquired the habit of reading as a leisure activity. Over the years efforts to promote the reading habit have been the objective of numerous organizations. The Institute for the Intellectual Development of Children and Young Adults, for example, has an active publishing unit that has created and distributed numerous high-quality publications. From 1974 to 1976, the budget of the Institute grew from \$7.5 million to \$14 million. Franklin Books, Iran, founded in 1954, also played an important role in the development and printing of educational material, but in 1976 completely shifted its operations to educational research.

The demand for printing for packaging grew at close to 50% annually from 1973–75. Part of this growth was due to increases in industrial output. The rest was a result of increased use of packaging for distribution of products previously not packaged or only packaged in bulk form.

The growth in demand for printed cardboard and corrugated cartons was very strong and the Government—acting through the Industrial and Mining Development Bank (IMDBI)—offered incentives in an effort to raise production. An example of a new firm formed with the assistance of the government incentives is Kartonkar Company. IMDBI promoted the establishment of Kartonkar and provided it with bank loans and equity capital. Kartonkar began production in 1975 and has a capacity to produce 20 tons of printed cartons per day. By 1976, there were 18 firms specializing in producing printed cartons. Many other large manufacturing companies had established their own production units. Experts in the industry estimated that installed capacity had risen above requirements and that there will be excess capacity for several years.

Demand for other types of package printing also rose rapidly during the first half of the 1970's. Increased use of packaging is most pronounced in the food industry. Food products such as tea, sugar, spices, meat, fruits, vegetables, and nuts, traditionally sold in bulk form, are increasingly marketed in packages. Output of the food processing industry grew at 10% per year between 1973–75. Use of metal containers is on the rise, and 20 firms pro-



duced cans in 1976. Most of these produced cans for their own use, although there were three can manufacturers who sold metal containers commercially. Most cans have printed paper labels attached; however printed cans are used for motor oil, vegetable shortening, and a few other processed food products. Container Corporation of Iran is the largest commercial supplier of printed cans. Imports have risen despite the growth of domestic can production. Similarly, imports of labels and other printed packaging material rose from an estimated \$1.7 million in 1973 to \$3 million in 1975. Many companies feel they cannot obtain high quality packaging domestically. The pharmaceutical industry, for example, imports most of its printed packaging. Domestic producers of food and consumer items are becoming increasingly aware of the importance of the appearance of packaging, particularly where their products compete with quality packaged imports.

A new private publishing venture, Sherkate Chap va Nashreh Daneshe-Now (New Knowledge Printing and Publishing Company) was started in 1976 largely through the efforts of the Empress Farah. It was in the formulation stage for several years. The venture was initiated at the end of the summer of 1976, when the Industrial and Mining Development Bank of Iran concluded an agreement with Time Inc. of the United States. This venture represents a new departure for the industry, since it will be an integrated operation combining research, publishing, and printing. The new company hopes to stimulate a substantial reading audience for its books and educational material.

Time prepared the original feasibility study and will provide technical expertise in developing the firm's publishing activities. As of late 1976, Daneshe-Now had not yet concluded a technical services contract for the development of the project's printing component. Plans call for a total investment of \$42 million in the firm's publishing and printing divisions. Of the approximately \$27 million to be invested in the printing operation, over \$9 million is to go for equipment.

The Rastakhiz political party intends to build a large publishing and printing facility in Tehran. The Party plans to print a newspaper, magazines, books, posters, and a variety of other printed matter. The following indicates the range of publications and capacity of the project.

Publications	Frequency	Circulation
Rastakhiz Newspaper . . . . .	Daily	200,000
Rural Magazine . . . . .	Monthly	230,000
Labor Magazine . . . . .	Monthly	240,000
Youth Magazine . . . . .	Monthly	50,000
Talash Magazine . . . . .	Monthly	30,000
Books . . . . .	As required	10,000 copies/ month
Brochures . . . . .	As required	Unspecified
Posters . . . . .	As required	Unspecified

There are no budgetary limitations on this project, and design bids are scheduled to be let for tender in 1977. The plan calls for a modern complex with fully computerized prepress facilities and high-speed pressroom equipment.

Another large project is being undertaken by the 25th of Shahrivar Printing House. It plans to double the printing capacity of its new plant by 1978 by the addition of five new web presses. Total investment for this expansion is not known, but the company estimated that the cost of the presses alone will total over \$7 million.

## GROWTH PROSPECTS

Output of Iran's printing and publishing industry is expected to grow at an annual rate of about 20% from 1976 through 1980. Particularly strong growth is expected in the specialized area of printing for packaging and high quality color printing. According to the managements of firms engaged in color printing, the critical obstacle to increased growth is the lack of skilled labor.

Demand for commercial printing is expected to continue to grow, but it is unlikely that the number of firms will increase rapidly or that there will be a significant growth in the number of employees. There is considerable excess capacity among the small commercial printing job shops. Main reasons for this situation according to trade sources are the extremely small size of the typical shop and a shortage of skilled labor, particularly typesetters. As a result, the trend toward industry consolidation and less labor intensive printing processes is very likely to continue. Small shops which do not modernize will find it more and more difficult to compete.

Growth in publication of trade books, magazines, and newspapers will depend largely on the Government's press policies. In addition, critics of the educational system point out that many fundamental changes will have to be made before students are encouraged to read outside the specific subject areas of school curricula. Students in secondary schools may take as many as 20 subjects a year, leaving little time or incentive for outside reading. School libraries are often very limited, and many do not lend books. Conditions are not much better at the university level. According to 1975 published figures, some of the larger universities have several well-equipped libraries, but 41 of the 213 institutions of higher education have no libraries at all. By mid-1976, it was evident that there had been some recovery in the publication of trade books, magazines, and newspapers from the decline of 1974-75. By late 1976, increased promotional efforts both by the Gov-



ernment and private institutions were beginning to show results. The output of books, newspapers, and periodicals is expected to grow at an average rate of 10% annually during 1976-80. More rapid growth would require the relaxation of some government controls and further promotional efforts by the industry.

It is expected that the rapid growth of printing for packaging will continue during the 1976 to 1980 period. Growth will be highest in the more specialized types of printing such as multicolor printing and printing on metal and plastic materials.

## **CAPITAL GOODS MARKET**

Printing and graphic arts equipment is not manufactured in Iran; the entire market is supplied by imports. Sales more than doubled from 1974 to 1975 to a total of \$18.5 million (see table 4). Most of this equipment was for new plants. Approximately 36% went for replacement of existing capacity. Approximately 80% of the large increase in 1975 went to equip the new printing plant of the 25th of Shahrivar Printing House. The market is expected to fluctuate through 1980 when it is projected that total sales will be approximately \$23 million.

### **Imports**

Iranian imports of prepress and bindery equipment are expected to grow faster than imports of pressroom equipment. The overall shortage of trained labor in the industry is most acutely felt in the prepress and finishing processes. In 1975, 15.4% of total sales were of prepress equipment and 7.3% of bindery and finishing equipment.

West German suppliers have the largest share of printing and graphic arts equipment sales to Iran. They consistently account for 50% or more by value of the total market. In 1975, the 52% share of West German suppliers was followed by British firms with about 16% and United States suppliers at 11%, up from 3.5% in 1974. West German suppliers lead in sales of pressroom equipment as well as bindery and finishing equipment. Their dominance of the market is due to a number of factors. Users cited the excellent service available from German manufacturers as most important. German equipment is sold through aggressive and financially strong representatives who emphasize the availability of spare parts and maintenance services.

Imports of prepress equipment rose 87% between 1973 and 1974 and 71% in 1975 to a level of \$2.8 million. Imports of prepress equipment are projected to expand to \$5 million by 1980. British suppliers have the largest share of the market for prepress equipment particularly for keyboard photo-

composition equipment. They accounted for two-third of this market segment in the mid-1970's. A large portion of the equipment shipped from Britain is supplied by British manufacturing subsidiaries of U.S. companies. Imports of prepress equipment directly from U.S. suppliers accounted for only 2% of sales in 1975.

West German suppliers have traditionally dominated the Iranian market for pressroom equipment. They accounted for nearly 62% of sales in 1975, valued at \$8.8 million. Total pressroom equipment imports were \$14.3 million in 1975. Sales are expected to surpass \$15 million in 1980. U.S. suppliers accounted for sales of pressroom equipment valued at over \$1.6 million, representing a market share of 11%.

Imports of bindery and finishing equipment grew 92% from 1973 to 1974 and another 73% in 1975 to \$1.4 million. By 1980, the total market for this equipment is expected to be \$2.5 million. United States and West German suppliers each sold approximately \$0.4 million in value of finishing equipment in 1975.

### **Domestic Manufacturing**

The only Iranian manufacturing of printing equipment consists of some tools used in cutting and hand binding, such as knives, pressure presses, glue applicators, needles etc. Some spare parts also are fabricated on a job basis. All equipment requirements of the industry are expected to be supplied by imports through 1980.

## **MARKET OPPORTUNITIES**

Imports of printing and graphic arts equipment are expected to increase, despite the fact that overcapacity is prevalent in certain segments of the industry. This increase is expected to result from replacement of obsolete equipment in existing plants as well as from new installations in large projects already planned.

Since the majority of printing shops in Iran are small, there will continue to be demand for relatively low and medium capacity equipment. High-volume, high-speed printing equipment, sophisticated prepress equipment, as well as information handling and retrieval systems will be purchased, particularly for the large new projects that are scheduled to begin operations between 1977 and 1979.

Three large projects to be implemented in the 1977-78 period (those of the 25th of Shahrivar Printing House, Daneshe-Now and the Rastakhiz Party) will require the latest in computerized typesetting, high-quality photocomposition and graphics equipment, high-speed pressroom machinery and

**Table 4.—Iran: The Market for Printing and Graphic Arts Equipment**  
(in thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>PREPRESS EQUIPMENT</b>					
Imports					
United States .....	6	21	53	40	300
West Germany .....	163	165	322	—	—
Japan .....	85	90	251	—	—
United Kingdom .....	374	1,033	1,836	—	—
Other .....	261	356	383	—	—
Market Size .....	889	1,665	2,845	2,600	5,000
<b>PRESSROOM EQUIPMENT</b>					
Imports					
United States .....	561	250	1,633	2,224	1,900
West Germany .....	3,778	3,544	8,824	—	—
Switzerland .....	633	452	1,172	—	—
United Kingdom .....	211	534	812	—	—
Other .....	1,134	1,068	1,874	—	—
Market Size .....	6,317	5,848	14,315	8,002	15,400
<b>BINDERY AND FINISHING EQUIPMENT</b>					
Domestic Production .....	—	—	—	—	—
Imports					
United States .....	28	16	390	270	600
West Germany .....	106	443	460	—	—
Switzerland .....	226	246	125	—	—
United Kingdom .....	11	17	290	—	—
Other .....	37	62	95	—	—
Market Size .....	408	784	1,360	1,210	2,500
<b>TOTAL MARKET FOR PRINTING AND GRAPHIC ARTS EQUIPMENT</b>					
Imports					
United States .....	595	287	2,076	2,534	2,800
West Germany .....	4,047	4,152	9,606	—	—
Switzerland .....	876	715	1,365	—	—
United Kingdom .....	596	1,584	2,938	—	—
Other .....	1,500	1,559	2,535	—	—
Total Market Size .....	7,614	8,297	18,520	11,812	22,900

<sup>1</sup> Estimates.

Source: United Nations, Organization for Economic Cooperation and Development, supplier country and official Iranian trade statistics; estimates based on trade interviews.

modern finishing and binding equipment. Value of the equipment required for these three projects is expected to exceed \$20 million.

**Prepress Equipment.**—Prepress equipment should find a good market in the late 1970's. The use of offset printing equipment is increasing. In line with this trend, photocomposition equipment, cameras, and platemaking equipment will account for an increasingly large share of the market. There will be opportunities for sales of keyboard computerized typesetting equipment to medium size and larger printing plants.

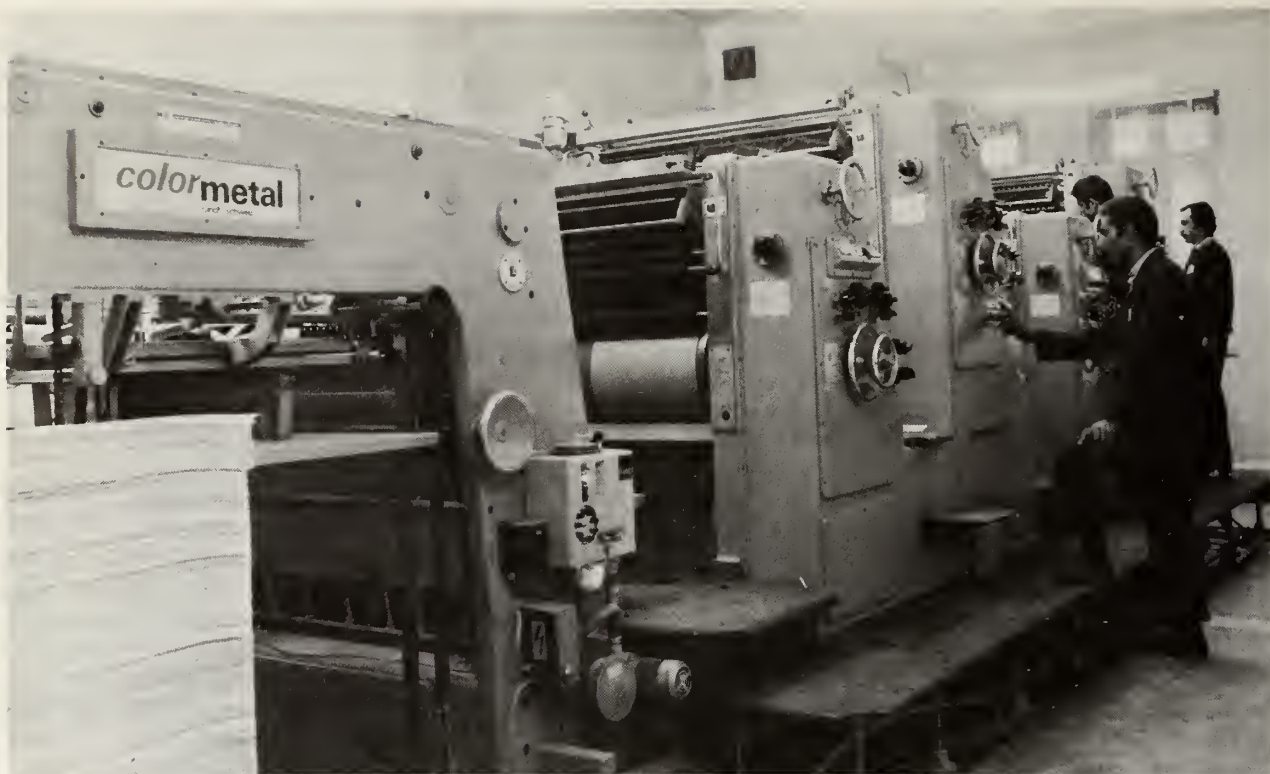
**Pressroom Equipment.**—Sales of pressroom equipment, while not growing quite as rapidly as those of prepress and finishing equipment, will continue to be the largest market. Low-volume easily maintained equipment will be the most common type purchased, since few printing houses have the volume of printing to require the large high-speed presses. There will also be increased sales of high-speed web offset presses for the larger new printing projects.

Most new presses will be offset rather than letterpress, and the fastest growing single segment of the market will be small- and medium-sized offset equipment. Specialized presses for printing on plastic and metal, for labels, and for other printing for packaging will also be required in this growing segment of the industry.

**Bindery and Finishing Equipment.**—The fastest growth will be in sales of bookbinding equipment. Most of this equipment will be purchased for the larger book printing projects, although smaller book printers and government printers will also require binding equipment. There will also be increased opportunities for sales of cutting and folding equipment.

**Technical Services.**—A market is developing for two types of technical services in the printing and publishing industry: professional services for the design and selection of equipment for the larger facilities and maintenance services. Management services are used on a limited basis. The Time Inc.





*The trend toward offset printing is expanding the market for U.S. equipment.*

arrangement with Daneshe-Now is the first large-scale service contract to cover operations, management, and training.

## MARKETING ENVIRONMENT

### Buyers' Universe

There are more than 1,000 users of printing equipment in Iran. The private sector is the largest customer for printing equipment. The principal market segments are the 15–20 large publishing and printing firms, 20–25 specialized quality printers, several hundred small commercial printers, and the approximately 70 government printing plants. There also is a growing number of in-house printing for packaging plants in the food processing and other consumer industries.

**Large Publishing and Printing Firms.**—Included in this group are the larger newspaper/periodical publishers like Kayhan and Ettela'at and the major commercial printing companies such as Offset. These three firms indicated that their primary consideration in purchasing decisions is the technical quality and performance of the equipment. The second consideration is the availability of after-sales service. The larger printing houses have qualified technical experts capable of assessing most machine perform-

ance prior to purchase, but often seek the assistance of professional consultants for larger purchases. These larger printers often purchase directly from the headquarters of supplier companies in Europe or the United States.

**Specialized Quality Printers.**—The number of firms catering to the market for high quality specialized printing such as color offset and package printing is small but growing. These firms are often small. Decisions on equipment purchases are made by the proprietor who is often a master printer. While limited financial resources often are a restraining factor for the smaller specialized printer, they are concerned with quality and performance, and these factors often outweigh price, particularly if competitive terms are offered.

**Small Commercial Printers.**—These printers generally have from one to five presses in their shops. The decisionmaker is typically the proprietor of the firm. He is reluctant to purchase equipment with which he is unfamiliar, and is frequently more concerned with equipment durability than its speed or print quality. Since profit margins have narrowed for small commercial printers and financial resources are limited, the proprietor is very price conscious. Many of the small commercial printers feel the need to modernize their shops but their sources of trade credit are severely limited, and availability of sup-

plier credit can be a determining factor in purchase decisions.

**Government Organizations.**—Those government organizations heavily engaged in printing generally rely on their own technical staff to pass on recommendations on printing equipment purchases. An outside consultant may be used if the planned purchase is large. The larger organizations usually purchase directly from the supplier. Government agencies with smaller printing shops usually buy equipment that is available on the local market.

## Foreign Suppliers' Universe

There are approximately 50 foreign manufacturers of printing equipment which have some form of sales representation in Iran. Most equipment is shipped directly from the supplier's home manufacturing plant except in the case of prepress equipment which a number of U.S. firms supply from European-based subsidiaries.

British suppliers have held the dominant position in sales of prepress equipment. Linotype-Paul Ltd. (U.K.) a division of Eltra Corp. of the United States, supplies equipment with a good reputation among the larger printers. Monotype Corporation Limited of Britain has made considerable sales of keyboard typesetting equipment to medium and large printing shops, and of computerized typesetting/editing systems to larger printers. Harris-Intertype Corporation of the United States sells equipment commonly used in the large and medium sized printing plants.

The leading supplier of reproduction cameras is Klimsch & Co. of West Germany, while E. I. du Pont de Nemours & Co. of the United States is the leading supplier of film processing equipment. Monotype Corporation has supplied its Monophoto 400/8 Filmsetter to several printers. Durst S.p.A. photographic equipment from Italy is also sold in Iran.

Heidelberger Druckmaschinen AG. of West Germany has historically been the major supplier of press equipment in Iran. The Heidelberger sales agency was established in 1927 and has an extremely high reputation in the industry. Heidelberger letter presses are found in the majority of printing shops in Iran and many printers prefer Heidelberger presses because they were trained on them. Heidelberger almost completely dominated the market through the 1960's. The market began to shift toward offset equipment in the early 1970's and other suppliers have been able to gain a significant level of sales. Pressroom equipment supplied by Hantscho of the United States, Korenig and Bauer, Roland Offset AG. and M.A.N. AG., all from West Germany, and Solna AB. Sweden has become established in the market.

Of these lines of equipment, Roland is the most popular for offset printing, although Rotaprint of West Germany is fast gaining a good reputation for its small to medium-sized presses. Rotaprint set up a separate sales and service company in Tehran and has been successful in supplying a number of government agencies with medium-sized offset presses. In 1975, Hantscho of the United States sold five high-speed web-type rotary offset presses; three more large Hantscho presses were scheduled to be shipped to Iran in 1977. The total value of these three presses has been estimated at close to \$4.5 million; parts of the machines will be supplied from Britain, West Germany, and Italy, as they were for the presses supplied in 1975.

The leading suppliers of bindery and finishing equipment for the printing industry in Iran through 1974 were Wohlenberg & Co. and Krause-Biagosch GmbH., both of West Germany and Mueller Martini AG. of Switzerland. All three of these suppliers are represented by effective sales agents. Much of the equipment supplied by these three firms has been cutting machines. The leading supplier of folding machines has been Stahl of West Germany.

Finishing equipment for the book industry has been supplied largely by Swedish firms, most notably Rotodox and Bobst, although some has been supplied from the Soviet Union. In 1975, The Sheridan Co. of the United States made excellent sales of bookbinding equipment.

## Marketing Factors

In 1976, there were seven large firms, all located in Tehran, who were representatives, agents, and distributors for sales of printing and graphic arts equipment. Each of these major firms handles a wide line of prepress, pressroom, bindery, and finishing equipment. Each represents a number of supplier companies from several countries and all stock some parts and provide after-sales service. In all, there were over 50 foreign supplier companies represented by these seven firms.

Photographic equipment for the printing industry is sold through the major printing equipment representatives, but some is also sold through representatives specializing in drafting or photographic equipment.

Historically, printing equipment has been sold through the specialized representatives, but in the mid-1970's there was a slight shift and some suppliers have their own sales and service companies in Iran.

Except for bookbinding machinery, printing equipment imports for private firms are subject to small customs duties and import taxes. Prepress and pressroom equipment are subject to customs duties of 5% of c. and f. value. Lithographic prepress equipment is assessed an additional 6% ad valorem



commercial benefit tax. Government organizations are exempt from these duties and taxes.

The Ministry of Information must approve the importation, sale or movement of any printing equipment in Iran. In addition, importers must obtain permission from the Ministry of Industry and Mines each time they import printing equipment.

## **COMPETITIVE POSITION OF U.S. SUPPLIERS**

As of 1976, only a few U.S. manufacturers of printing and graphic arts equipment were represented in Iran and most U.S. equipment is relatively unknown to Iranian printers. The few U.S. firms active in the market have appointed representatives who are well established and have longstanding good reputations.

Many U.S. suppliers, such as Harris-Intertype Corporation and Eltra Corporation supply primarily from the United Kingdom. George Hantscho Co., Inc. supplies directly from the United States, but parts of its presses are built and shipped by suppliers in Britain, Germany, and Italy.

Until the early 1970's, the market for U.S. high-

volume equipment was limited. Most U.S. suppliers who tried to enter the market prior to 1970 had marginal success and many Iranian printers who purchased U.S. equipment complained that they were unable to get it serviced.

The value of U.S. equipment sold in Iran dramatically increased in 1975. The market potential for U.S. equipment is expected to improve due to its applicability in planned large projects, the trend toward consolidation in the industry, and the Government's interest in upgrading both publishing activities and the quality and efficiency of printing shops.

To increase sales U.S. firms should make a more active sales promotion effort. Selling through the well-established distributors can help sales, but many users of printing equipment state they would welcome a more active and direct approach by manufacturers. A viable alternative would be for a group of U.S. manufacturers who supply complementary machinery to form a consortium which would establish a sales/service office in Tehran. Through a more concerted marketing effort, it is estimated that U.S. suppliers could raise their market share an additional 10 to 15% by 1980, representing over \$5 million in sales.

# Textiles and Apparel Manufacture

A GROWING domestic market and government incentives for private investment have combined to stimulate growth of the Iranian textile and garment industry. The Government has implemented incentive programs because it recognizes the potential of the textile industry to provide critical foreign exchange earnings in the coming decades when oil exports will decline. While divesting itself of most direct holdings in the industry, the Government has indirectly provided investment financing through the government development banks.

The major trend in the industry will be toward the establishment of larger and more capital intensive manufacturers. Industry revenues from textiles production were \$288 million in 1970. They rose to \$1.1 billion in 1975 and are expected to reach \$2 billion by 1980. In 1975 Iran's textile production capacity was increased considerably through plant modernization and construction. Investment is projected to increase an average 20% annually in the 1975-80 period.

Iran's market for textile machinery is expected to grow as the trend to industry automation continues. Synthetic fiber production equipment will be a particularly strong sales growth area. Textile machinery imports rose from \$108 million in 1974 to \$212 million in 1975, and are projected to reach \$270 million by 1980. U.S. textile machinery manufacturers have supplied only a minor amount of Iran's imports, partly because of the long shipping distances, but also because U.S. equipment is generally designed for higher volume production than has been required by Iranian industry. Recent developments, however, are creating a demand for high volume and quality textile production machinery in Iran. U.S. suppliers will have an excellent opportunity to increase their share of the market through 1980.

## STRUCTURE AND SIZE

Production of textiles has been a flourishing industry throughout history, in Iran. Iranian textiles, particularly carpets and tapestries, have had world-wide recognition for centuries. In present day Iran both modern textile plants and traditional production methods flourish, with fine handwoven carpets

and fabrics such as brocades and embroideries being produced by traditional methods. From the completion of Iran's first modern textile plant in the early 1930's, the textile industry has grown rapidly. In 1976 it included 72 manufacturers engaged in spinning and weaving cottons, woolsens, and synthetic fabrics. Only since the mid-1960's have polyesters and other synthetic fabrics been produced in Iran.

In 1975, the output from all textile garment and shoe manufacturing plants in Iran was valued at \$1.1 billion. Production of textile fabrics accounted for two-thirds of this amount (see table 1). During the same year, Iran imported yarns, fibers, and fabrics valued at \$356 million. Textile fabrics accounted for \$64 million of this amount. Iran's production of knitwear expanded rapidly in the early 1970's. Knitware accounted for one-third of the country's \$24.8 million textile exports in 1975.

Total capital investment in the Iranian textile industry in 1975 was \$304 million of which \$211.6 million went for the purchase of new and replacement equipment. It is estimated that \$146 million was for spinning equipment and plants. A major portion of this money went for plant investment in large projects for extrusion and spinning of synthetic fibers. These projects will be ready for equipment in 1977 and 1978.

It is further estimated that Iranian investment for weaving equipment and facilities accounted for over one-third of total investment, or about \$117 million. Investment in the shoe manufacturing industry in 1975 was approximately \$24 million, while investment in industrial garment manufacturers was about \$15 million, or about 8% and 5% respectively of total investment in the textile industry for the year.

**Spinning and Weaving.**—There were 72 textile manufacturing companies engaged in spinning and weaving yarns and fibers in 1976. Twenty firms were solely engaged in spinning either thread or yarns, while the remaining 52 were integrated operations combining both spinning and weaving. Of these integrated plants, there were 16 firms producing woolen and worsted textiles (see table 2), the remainder weaving cotton and synthetic fabrics. Most textile plants are privately owned. The Government has been reducing its direct role in the tex-





*Traditional rug weaving continues to hold its place in the Iranian textile scene with today's modern spinning and weaving mill.*

tile industry. In 1976 it had controlling ownership of only 5 textile manufacturing firms.

In 1975 Iran's production of yarns amounted to 131,000 tons of cotton blended yarn, 4,000 tons of acrylic yarn and almost 6,000 tons of nylon 6. The majority of spinning companies produce cotton blend yarn. Only two companies were producing nylon 6 yarn, and four small firms were spinning acrylic fiber yarn. There were approximately 1.2 million spindles in use in the country in the mid-1970's.

Sanaye Poushesh Iran Industry is a private textile company formed in 1971. It is owned 33% by private interests, 18% by the Industrial Credit Bank and 49% by the Industrial and Mining Development Bank of Iran. Total capital investment in the company is \$90.4 million, of which \$42.6 million was the value of plant equipment in 1976. Plant machinery was delivered during 1975, mainly from West Germany, Switzerland, and Great Britain. The firm employed 1,000 persons in 1976, and is expected to employ 5,000 by 1980. When construction is completed, Sanaye will have a complex of six separate plants. The first, a velvet production line, was already in production in 1976. In 1977 this plant will produce 5 million meters of velvet, and capacity will be expanded later to 8 million meters. The plant had 165 weaving looms in operation in 1976. In

addition a towel manufacturing plant with 480 weaving machines and a production capacity of 6 million meters was undergoing trial production.

The Mazandaran Textile Company was established in 1957 by the Ministry of Industry and Mines and the Industrial Credit Bank of Iran. It began producing at its plant located in Shahi, Mazandaran in 1960. Production that year was 40,000 meters of cotton and synthetic fabric. It was a totally government-owned company until 1975 when the decision was made to sell 49% of the shares to the private sector. In 1968, Mazandaran Textile expanded from its line of cotton and synthetic textile into woolsens.

The company's 1976 plant facilities included 35,600 spinning spindles for cotton and synthetics, 1,344 looms weaving cotton and synthetic cloth, and 32 looms for woolsens. The plant contained machinery from West Germany, Switzerland, Britain, and Czechoslovakia. In 1975, Mazandaran Textile sold 40% of its total sales of \$31.2 million through its chain of 60 retail shops throughout the country. In late 1976, its existing facilities were producing at better than 90% of capacity and Mazandaran Textile had almost completed construction on a new plant. This was expected to have a capacity of 30 million meters of cotton and synthetic fabrics when

Table 1.—Iran: Development of the Textile Industry

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>NUMBER OF COMPANIES</b>						
Yarn spinning companies .....	12	17	18	20	22	27
Textile fabric companies .....	28	31	32	36	38	45
Woolen weaving companies .....	10	13	15	16	16	18
Industrial garment manufacturers .....	4	7	7	8	10	12
Industrial shoe manufacturers .....	8	11	14	14	14	16
<b>NUMBER OF EMPLOYEES</b>						
Textile factories .....	57,000	72,000	87,000	95,000	104,000	172,000
Industrial garment manufacturers .....	12,900	16,300	17,850	22,000	24,000	37,700
Industrial shoe manufacturers .....	3,400	14,200	15,500	16,800	17,300	25,000
<b>OUTPUT</b>						
Cotton/synthetics (million m <sup>2</sup> ) .....	370	471	532	546	616	969
Woolen cloth (million m <sup>2</sup> ) .....	9	13.2	14.5	16	18	26
Jute (metric tons) .....	3,500	6,000	10,900	11,880	12,000	27,569
Footwear (million of pairs) .....	15	48	68	84	93	196
Moquette (million m <sup>2</sup> ) .....	0.9	1.3	1.5	1.7	1.8	2.7
Knitwear (metric tons) .....	28,050	38,500	43,000	45,000	51,000	75,100
Nylon (metric tons) .....	2,015	4,700	5,900	6,000	6,200	29,000
Cotton yarn (metric tons) .....	65,000	100,000	119,000	131,000	148,000	221,000
Acrylic yarn (metric tons) .....	—	3,000	3,000	4,000	4,200	6,800
<b>OUTPUT OF TEXTILE FACTORIES</b>						
(Millions of U.S. Dollars) .....	288	740	940	1,100	1,280	2,014
<b>CAPITAL INVESTMENT (Millions of U.S. \$)</b>						
Machinery .....	—	85.9	107.7	211.6	215	270.6
Structures .....	—	34.4	43.1	92.4	86	108.2
Total .....	110.3	120.3	150.8	304	301	378.8
<b>EXPORTS (thousands U.S. \$)</b>						
Carpets, mats .....	72,308	106,112	121,301	97,878	99,835	112,300
Knitted and crocheted fabrics .....	2,315	29,927	42,569	29,635	35,560	52,000
Shoes .....	1,380	10,692	7,447	8,688	9,990	14,500
Other textile fabrics .....	673	5,381	1,752	1,105	1,045	1,250
Total Exports .....	76,676	152,112	173,069	137,306	146,430	180,050

<sup>1</sup> Estimates.

Source: Ministry of Industry and Mines, Textile Syndicate of Iran, estimates based on trade interviews.

it begins production in 1977. Total investment in this expansion was close to \$30 million. Equipment for the plant was ordered exclusively from Switzerland.

**Knitting.**—The manufacture of knitwear is relatively new in Iran. While there have been many small knitwear producers operating for years, no sizeable production took place until the early 1970's. During the 1970's knitwear production has shown impressive growth and in 1976 there were 12 major manufacturers, all located in and around Tehran (see table 3). These 12 companies produced a total of 43,000 metric tons of knitwear products in 1975, 35% was warp knitwear and 65% weft production. The industry has begun exporting and the value of 1975 exports most of which were sold in Eastern European countries, amounted to \$8.4 million.

**Moquette and Carpeting Manufacturing.**—Eleven firms produced 1.5 million square meters of various kinds of floor coverings in 1975. Total consumption of machine woven carpeting was estimated at 2.5 million square meters and the excess demand was supplied by imports. The largest Iranian producer is Moulin Rouge Company. Its factory is located in

the Alborz Industrial City near Qazvin, 140 kilometers west of Tehran. Its products, under the trade name Moulin Moquette, are aggressively marketed through company-owned retail outlets in Tehran and major provincial cities. Sales of Moulin Moquette were about 450,000 square meters in 1975. The company's plant has a capacity of 1.5 million square meters (see table 4).

**Garment Manufacturing.**—In 1976 there were 3,675 Iranian firms producing finished garments. This number included thousands of small shirt and dress makers and tailors. Only eight companies can be classified as industrial garment manufacturers, and large-scale production of ready-made clothing, except for knitwear, is still in its infancy. Mahknit Company, a producer of garments and knitwear located in Karaj, 40 kilometers west of Tehran, produces 100,000 shirts, blouses, and dresses annually. Another company, Jamco, also located in Karaj, produces 314,000 men's suits annually under a technical assistance agreement with an Italian company. Iran Barak, a manufacturer of woolen textiles, was one of the earliest firms to produce ready-made clothing. It has its own chain of retail outlets for



**Table 2.—Iran: Major Woolen Textile Mills in Operation**

Company	Location	Description
Moghadam Factories Co. ....	Esfahan	Woolen textiles Capacity 2.5 million m <sup>2</sup> /year Synthetic textiles Capacity 5 million m <sup>2</sup> /year 1,562 employees
Pashmbafi Iran Barak.	Rasht	Woolen textiles Capacity 1.2 million m <sup>2</sup> /year Men's suits Capacity 60,000/year 600 employees
Pashmbafi Afshar Factories Co. ....	Yazd	Woolen textiles Capacity 1 million m <sup>2</sup> /year Woolen blankets Capacity 30,000 units/year 606 employees
Pashmbafi Jahan Co. .	Qazvin	Woolen textiles Capacity 700,000 m <sup>2</sup> /year Woolen blankets, Capacity 100,000 units/year 485 employees
Pashmbafi Cashmere Co. ....	Kermanshah	Woolen textiles Capacity 600,000 m <sup>2</sup> /year Woolen blankets Capacity 20,000 units/year Thread Capacity 30,000 spindles/year No. of employees not available
Darakhshan Yazd Spinning and Weaving Factories .	Yazd	Woolen textiles Capacity 450,000 m <sup>2</sup> /year Woolen blankets Capacity 8,400 m <sup>2</sup> /year Cotton textiles Capacity 80,000 m <sup>2</sup> /year Thread Capacity 65,000 spools/year No. of employees not available
Kuroghli Co. ....	Qazvin	Woolen Textiles and blankets Capacity 450,000 m <sup>2</sup> /year 256 employees
Sanaye Pasham Isfahan Co. ....	Esfahan	Woolen textiles Capacity 7,500 m <sup>2</sup> /day 1,300 employees
Vatan Co. ....	Esfahan	Woolen textiles Capacity 5,600 m <sup>2</sup> /day 1,463 employees
Taj Isfahan Spinning and Weaving Co. .	Esfahan	Woolen textiles Capacity 4,000 m <sup>2</sup> /day 900 employees
Risbaf Co. ....	Esfahan	Woolen textiles Capacity 4,000 m <sup>2</sup> /day 835 employees
Mihan Baf Spinning and Weaving Co. .	Esfahan	Woolen textiles Capacity 2,500 m <sup>2</sup> /day 491 employees

Source: Ministry of Industry and Mines, Industrial Credit Bank, Industrial and Mining Development Bank of Iran, Textile Syndicate of Iran, trade interviews.

sale of finished clothing and yard goods called Shomal Suit Making Company (see table 5).

**Shoe Manufacturing.**—In 1976 there were 14 shoe manufacturing companies operating in Iran. Three large firms (Bella, Melli, and Wien) manufactured

**Table 3.—Iran: Major Knitwear Producers, 1976**

Company	Location	Description
Denis Tricot .....	Tehran	Full line of knitwear Capacity 110 tons/year 90 employees
Elizabeth Factory ..	Tehran	Women's dresses Capacity not available 37 employees
Pars Knit Factories ..	Tehran	Woolen, cotton, and synthetic knitted textiles Capacity not available 600 employees
Shams Knitting Co. .	Tehran	Knitted textiles and knitted garments Capacity not available 16 employees

Source: Ministry of Industry and Mines, Industrial Credit Bank, Industrial and Mining Development Bank of Iran, Textile Syndicate of Iran and trade interviews.

**Table 4.—Iran: Major Moquette Manufacturing Companies, 1976**

Company	Location	Description
Dadfar Company ....	Tehran	Moquette, table cloths and bedspreads capacity 500 m <sup>2</sup> /day. 58 employees
Mahut Company ....	Esfahan	Felt carpeting; capacity 600,000 m <sup>2</sup> /year. 50 employees
Mekaleum Iran Co. .	Tehran	Plastic floor coverings, wall paper, machine-produced carpets and moquette; capacity not available. 150 employees
Moulin Rouge Co. .	Qazvin	Moquette; capacity 1,500,000 m <sup>2</sup> /year. 65 employees
Sayeh Rowshan Co. .	Tehran	Venetian blinds, Floortex floor coverings moquette; capacity 1,000 m <sup>2</sup> /day. 200 employees
Shahbaf Company ...	Rasht	Moquette. 300,000 m <sup>2</sup> /year. 180 employees

Source: Ministry of Industry and Mines, Industrial Credit Bank, Industrial and Mining Development Bank of Iran, Textile Syndicate of Iran, and trade interviews.

43% of all machine-made footwear in Iran that year. In addition to industrial manufacturers, a large number of small workshops produce handmade leather shoes. (see table 6). In 1970, these workshops accounted for almost 90% of all footwear sales in Iran. By 1975 they accounted for only 23% of total sales. Iran produced 103 million pairs of shoes in 1975, of which 82.4 million were industrially manufactured. Iranian-produced footwear has found good export markets, and over 14 million pairs of shoes were exported in 1975, mainly to East European countries.

The Melli Industrial Group is the largest producer and exporter of shoes. It was established in 1959. By 1976 it was a flourishing complex of 27 factories producing various types of footwear and related products. Products of the group's various factories include tanned leather, glue, zippers, shoe frames, synthetic heels and soles, stockings, and a wide line of footwear. Melli maintains a network

of 300 retail shoe outlets throughout the country. It also sells wholesale in Iran at 15% below retail price, and is expanding in all areas of production. Existing facilities in 1976 employed 8,000 persons, with a total production rate of 45,000 pairs of footwear per day. About 35% of total output is exported to Europe, the Soviet Union, and Middle East countries. Melli's production technology is mainly European and most of its plant machinery is from West Germany and Britain.

The Bella Shoe Company is the second largest shoe producer in Iran. It was planning to expand its retail outlets in the late 1970's. Wien Shoe Company is the third largest producer, and like the Melli Industrial Group, is expanding its export markets. In July 1976, Wien Shoe concluded a 3-year agreement with the Hungarian foreign trade company Konsumex for export of \$3 million worth of shoes.

**Other Manufacturing.**—Consumption of jute fabrics, gunny sacks, rope, and miscellaneous products

**Table 5.—Iran: Major Garment Producers (1976)**

Company	Location	Description
Danesh Tailoring Factory .....	Tehran	Worker's uniforms Capacity not available 204 employees
Daryaye Poushak Factory .....	Tehran	Worker's uniforms Capacity 200/month Leather jackets Capacity 200/month Men's suits Capacity 45/month Men's shirts Capacity 120/month 46 employees
Elizabeth Company ...	Tehran	Women's garments Capacity not available 38 employees
Iranal Company .....	Tehran	Women's garments Capacity not available 47 employees
Jahan Department Stores .....	Tehran	Shirts, coats, workers' uniforms Capacity 600 garments/day 46 employees
Jamco .....	Tehran	Men's suits, children's and women's apparel Capacity 320,000 garments/year 385 employees
Mahknit Company ....	Karaj	Dresses, blouses, shirts Capacity 100,000 garments/yr.
Pashm Bafi Iran Barak.	Rasht	Men's suits, woolen textiles Capacity 60,000 suits/year 600 employees
Susan Factory .....	Tehran	Worker's uniforms Capacity 450/day 45 employees
Zandaniyan Workshop (Tehran Police Cooperative) .....	Tehran	Garments Capacity not available 52 prison workers

Source: Ministry of Industry and Mines, Industrial Credit Bank, Industrial and Mining Development Bank of Iran, Textile Syndicate of Iran, and trade interviews.

**Table 6.—Iran: Major Industrial Shoe Manufacturers (1976)**

Company	Location	Description
Melli Industrial Group, 22 subsidiaries, 6 producing shoes .....	Tehran	Full line of footwear Capacity 65,000 pairs/day 2,500 employees
Galous Iran Shoe Co. ..	Tehran	Men's shoes
Gabore Iran Shoe Co. ..	Tehran	Women's shoes
Gustaf Hoffman Iran Co.	Tehran	Children's shoes
Chakmeh Sazi Co. ....	Tehran	Boots
Standard Co. ....	Tehran	Canvas Shoes
Otafuku Iran Co. ....	Tehran	Plastic Slippers
Bella Industrial Group, 4 subsidiaries .....	Tehran	Full line of footwear Capacity 60,000 pairs/day 2,000 employees
Jam Shoe Co. ....	Tehran	Plastic and canvas shoes Capacity 10,000 pairs/day
Andreh Co. ....	Tehran	Leather shoes, capacity 5,000 pairs/day
Mahpoush Co. ....	Tehran	Leather shoes Capacity 5,000 pairs/day
Bella Co. ....	Tehran	Leather shoes Capacity 40,000 pairs/day 1,000 employees
Azadan Co. ....	Tehran	Ladies handbags and shoes (under license of Charles Jordan, France) Capacity 700 items weekly. 140 employees
Danube Shoe Factory .....	Tehran	Medical professional shoes Capacity 2,000 pairs/ month
Kafsh Iran Manufacturing Co.	Tehran	Men's and children's shoes
Se-setareh Shoe and Plastic Manufacturing Co. ....	Tehran	Canvas Shoes, plastic shoes and boots Capacity 10,000 pairs/day 572 employees
Kamal Shoe Co. ....	Tehran	Plastic slippers Capacity 1,500 daily 25 employees
Sholeh Shoe Factory .....	Tehran	Plastic Shoes and boots, Capacity 1,500 pairs/day 25 employees
Sport Shoe Company .....	Tehran	Leather and canvas sport footwear
Wien Shoe Manufacturing Co.	Tehran	Full line of footwear

Source: Ministry of Industry and Mines, Industrial Credit Bank, Industrial and Mining Development Bank of Iran, Textile Syndicate of Iran, trade interviews.

was 29,000 tons in 1975 of which 11,880 tons were supplied by Iranian manufacturers. In the mid-1970's demand was growing steadily for gunny fabric which is the main material used for grain sacks and which is also extensively used throughout the country as an inexpensive floor covering. The three major producers are located in the Caspian littoral where most of Iran's jute is grown. This industry has remained very labor intensive, particularly in the preweaving processing of fiber (see table 7).

There are numerous smaller firms making specialized products within the textile industry. Qeytanbafi Tabriz Company, for instance, produces woven



**Table 7.—Iran: Major Jute (Gunny) Producers (1976)**

Company	Location	Description
Gunny Bafi Shahi Co. . .	Shahi	Gunny cloth, sacks, and rope. Capacity 3,700 tons of jute/year. 875 employees
Gunny Bafi Rasht Co. . . .	Rasht	Gunny cloth, sacks. Capacity 2,500 tons of jute/year. 681 employees
Gunny Bafi Iran Co. . . . .	Mahmoodabad	Gunny cloth, sacks and rope. Capacity 10 tons jute/day. 320 employees

Source: Ministry of Industry and Mines, Industrial Credit Bank, Industrial and Mining Development Bank of Iran, Textile Syndicate of Iran, and trade interviews.

elastic for the garment industry. Another firm, Mehrabad Weaving and Spinning Company, produces woven material used for linings in the shoe industry. These firms are usually small and employ no more than 10 to 15 people.

### Principal Government Offices

The Ministry of Industry and Mines has regulatory control over the textile industry. This government agency is responsible for the regulation of imports through raising or lowering tariffs. They also maintain all statistics on the number of firms, output, and imports.

The Price Intelligence Center affiliated with the Ministry of Commerce regulates prices of domestic products. This agency reviews price increases sought by domestic manufacturers and has the final authority on prices of locally produced textiles, shoes, and knitwear.

### TRENDS, PROGRAMS, AND PROJECTS

The Iranian textile industry was relatively underdeveloped in the 1960's. Since that time it has expanded and modernized with the assistance of government programs and liberal development bank financing. Changes in Iranian consumer practices have also benefited industry development.

Slightly more than 80% of the total of \$581 million invested in the textile industry during the Fourth Development Plan period (1967/68–1972/73) was from the private sector. The revised Fifth Development Plan (1972/73–1977/78) called for \$761.4 million to be invested in the textile industry, equivalent to 6.9% of all industry investment. Planners expected 89% of the investment to come from the private sector. By March 1976, a total of \$575 million had already been invested. It is estimated that an additional \$680 million will be invested by March 1978, making a total of \$1.255 billion for the 5-year plan period, almost 65% over the amount originally planned.

Because of the industry's continuous growth it has been targeted for further development by the Government with the purpose of increasing the country's export earnings. There are three policy programs which influence the development of the textile industry.

**Incentives.**—New projects and expansions of existing facilities in textile manufacturing are eligible for a wide range of government-sponsored incentives. As part of a general policy for the decentralization of industry, such projects can qualify for tax exemptions of from 5 to 10 years, depending on the region in which the plant is located. Additionally, the government development banks are encouraged to loan up to 60% of the total capital requirements for textile production projects. Such development loans have very attractive terms: Up to 5-year grace periods free of interest, 10- to 15-year repayment schedules, and relatively low interest rates of 8% to 9% (available only through development banks.) In development projects where loan capital is over 50% of total investment, the banks normally take a substantial equity position. This is done to ensure that the bank is represented on the company's board of directors and that it has a voice in management decisions.

**Government Development Projects.**—There are two types of textile manufacturing projects that the Government plans and implements. The purpose of the first type is regional development. Many relatively underdeveloped areas of the country are capable of supporting textile projects. The province of Baluchistan, for example, has very little industrial development, and private investors have little interest in undertaking large-scale projects in the province. Therefore, the Government has totally financed an integrated project for the growing of cotton and the production of cotton fabric at Iranshahr, one of Baluchistan's few population centers. The second type of project in which the Government is directly involved is for the purpose of integration and development of an industry which has only long-range profit potential. A case in point is silk production for which an integrated government project is located in the province of Mazandaran, one of the most thriving areas of the country. The project, which is planned as a long-term investment, includes tree planting and obtaining technology which is not yet available in the country. Through this project, the Government plans to develop a silk production industry and eventually to export silk products. The project began with 10 hectares of Japanese mulberry trees planted in 1974. By 1977 it is expected that the project will be enlarged to 600 hectares of trees and produce 33,000 metric tons of silk. Production is planned to reach 65,000 tons by 1982.

**Regulatory Policies.**—Through its incentives and direct involvement in development projects, the Government of Iran plans to build a textile industry that will be competitive in world markets. Production costs are high, however, and government policies have made private textile producers conscious of the need to lower production costs. For example, a consumer-oriented policy of price controls was instituted in the summer of 1975 to control inflation and fight excessive profit taking by producers and middlemen. With the rising costs of raw materials and labor, many producers felt forced to increase productivity in order to maintain profits. The 1974 price control policy had some beneficial results, but many industrialists took a "wait and see" attitude toward new investments. Unfortunately, a slight dampening of private investment took place just when expansion of the industry was viewed as critical by the Government.

The Ministry of Industry and Mines has regulatory responsibility for the textile industry. It assesses conditions of supply and demand and adjusts the market by regulating imports. In general the textile industry is protected by high import duties and bans on imports of certain categories of textiles. Application of this policy has proven difficult, however. In 1975, for example, the Ministry considered that a shortage of textiles existed, and to avoid an increase in price by domestic producers, it reduced restrictions on imports. As a result, consumers purchased such large quantities of imported fabrics that domestic producers had 100 million meters of unsold cloth in mid-1976.

While Iranian per capita income rose sharply in the mid-1970's, the portion spent on clothing—about 12.5% according to Central Bank estimates—remained at nearly the same level. The average middle class Iranian is very style conscious and many wealthy Iranians have regularly purchased their clothing from the best tailors of Paris, Rome, and London. In the 1970's, large numbers of Iranians traveled abroad, invariably returning with suitcases full of new clothing. This, in turn, has resulted in a greater demand for a variety of high quality textile products in Iran. New clothing styles now appear in the streets of Tehran as quickly as in European cities. Shops selling some European originals and Iranian copies are now common in the provincial cities as well as in Tehran. Some fashions clearly cut across traditional Iranian class distinctions. For example, Iranians have wholeheartedly adopted the worldwide denim craze. Denim styles are now worn by all classes.

Textiles used in Iranian homes and offices also underwent rapid changes in the 1970's. As late as 1960 there were no producers of wall-to-wall floor coverings and virtually no demand for this product.

With the rapid rise in prices of handmade carpets and changes in living styles, there were 11 carpet-producing plants in 1976 and demand was rising rapidly. Existing 1976 capacity, fully utilized, was sufficient to meet that year's demand for carpets. However, consumption is growing at over 20% per year. While there will be a market for an additional 2.2 million square meters by 1980 no new projects had been approved by early 1977. Upholstery materials were in high demand in the mid 1970's as were textiles for towels, draperies and canvas products.

## **Industry Development and Investment**

The rising demand for higher quality textiles and the incentives which the government provides contribute to conditions favorable for continued investments in the industry. In mid-1976 there were 20 textile industry development projects approved and in various stages of completion, requiring investments totaling over \$600 million (see table 8). These projects will account for an additional capacity of 460,000 spindles and 8,000 weaving machines. Approved spinning and weaving projects will account for most investment in the industry, totaling over \$590 million.

A textile industry segment which is expected to grow rapidly is the production of synthetic fabrics. Because of the rapidly expanding petrochemical industry in Iran, there will be a good supply of raw materials for production and export of synthetic fabrics. One major synthetic project is Polyacryl Iran, a joint venture between E.I. du Pont de Nemours & Co. of the United States and Behshahr Industrial Group. Polyacryl Iran is one of the few Iranian textile firms with foreign direct investment. This firm will produce 10,000 tons of rayon, acrylic, and other synthetic fibers and filaments starting in 1978. It is the largest single plant investment in Iran's textile industry, with capital investment totaling just under \$300 million. Imports of synthetic fibers will be restricted once the plant begins operations. Raw materials will be supplied by the domestic petrochemical industry beginning in 1981.

Another project for extruding and spinning nylon 6 will be undertaken by Parsylon Company. The firm recently obtained a \$20 million Eurodollar loan for its new complex in Khorramabad. Total estimated investment for the project is over \$85 million. The plant will have a capacity of 16,000 tons of polymer chips and will be capable of producing filaments of 20 to 200 denier of many cross sections and colors. Zimmer Ab of West Germany was awarded the contract to design the plant and supply most of its machinery.

Iran Knitting Company has begun construction of a nylon yarn plant with 7,000 tons annual capacity



**Table 8.—Iran: Textile Industry Projects Approved During 1974–76**

	Location	Capital in Millions of U.S. Dollars	No. of Employees	Description	Remarks
<b>SPINNING AND WEAVING PROJECTS</b>					
Polyacryl Iran .....	Esfahan	300.0	1,200	10,000 tons synthetic fiber & filament	Joint venture with du Pont
Sanaye Roushesh Iran .....	Rasht	90.0	1,000	4 million meters of denim 5 million meters of velvet	Operations on stream during 1976–78
Parsylon Co. ....	Khoramabad	85.0	NA	16,000 tons nylon yarn and filament	On stream 1978
Balouch Baft Co. ....	Iranshahr	62.0	2,000	30 million meters of cotton cloth	
Shahnaz Spinning & Weaving Co. (expansion) ...	Esfahan	15.3	4,050	30 million meters of cotton cloth	
Arya Textile Co. ....	Kashan	13.6	NA	9 million meters synthetic fabric	
Iran Knitting Co. ....	Qazvin	11.9	199	7,000 tons nylon thread	
Pilehvar Silk Co. ....	do.	9.2	NA	16,000 tons of processed natural silk/year	
Etemadieh Co. ....	Bushehr	4.4	302	7 million meters of chintz	
Nakhtab Co. ....	Tabriz	4.4	450	2,600 tons of cotton thread	
Mehr Coupa Co. ....	Esfahan	1.5	74	1,300 tons of cotton thread	
Gharb Wool Spinning Co. ....	do.	1.4	NA	Wool spinning	
Zaran Industrial Co. ....	Tehran	.8	186	5 million meters of collton cloth	Gov't project
Gilan Silk Industries Co. ....	Rasht	.7	NA	Silk fabrics	
Abare Shemal Co. ....	do.	.5	NA	Sponge and textiles	
Jalal Mohamad Co. ....	Yazd	.2	22	450,000 meters of silk cloth	
Mashad Khomeh Spinning Co. ....	Mashhad	.2	NA	Wool spinning	
Mazandaran Silk Project .....	do.	NA	NA	49,000 tons of processed natural silk/year	Gov't project
<b>KNITWEAR PROJECTS</b>					
Parsknit .....	Rasht	1.2	108	500 tons of knitwear	
Zangal Tric .....	Zanjan	.3	12	70,000 meters of knitwear	
Yaghouh Souferian Co. ....	Zanjan	.2	24	150 tons of knitwear	
<b>SHOE MANUFACTURING PROJECTS</b>					
Beba Co. (subsidiary of Bella Industrial Group) ..	Tehran	NA	NA	Leather shoes	Both to go on stream in 1979
Hassan Ardekani .....	Tehran	NA	NA	7 million pairs leather shoes	
<b>GARMENT MANUFACTURING PROJECTS</b>					
Imperial Organization for Social Services .....	4 locations	6.8	1,200		Construction complete in 1976
Iran Blue Jeans Co. ....	Amol	NA	NA	2 million pairs of blue jeans	
Iran Barak (expansion) .....	Rasht	NA	NA	150,000 men's suits	Expansion complete in 1977

Source: Ministry of Industry and Mines, Industrial Credit Bank, Industrial and Mining Development Bank of Iran, Textile Syndicate of Iran, and trade reviews.

at Alborz Industrial City near Qazvin. Du Pont (U.S.) has provided technical assistance for the design of the facilities which will require a total investment of \$11.9 million.

There has been a trend in Iran toward greater integration in textile production, and the major textile producers are among the most modern, marketing oriented enterprises in the country. Firms such as Mazandaran Textile Company and Kashan Velvet Company maintain a chain of retail outlets around the country through which they sell a large part of their output. It is expected that this trend will con-

tinue as more producers expand into manufacture of ready-made clothing and home furnishings.

The Sanaye Iran Poushesh Company is an example of a large new integrated project. In its final form it will be a complex of 13 different companies producing a wide range of textile products and integrated from spinning to retailing. The first stage of development of this project includes six companies: The velvet and towel companies already in production, and four more companies for spinning, the production of denim, readymade clothes, women's apparel, and blue jeans. All six are sched-

uled to be operational by 1979. Sanaye Iran Poushesh Company plans to sell most of its products through wholesalers but will also set up its own chain of four retail stores to be expanded later.

Balouch Baft Company was formed in 1974. It was one of the few government development projects being implemented in 1976. The company was financed by governmental development credits through the Industrial Development and Renovation Organization. The company's plant will be located in the provincial city of Iranshahr, a relatively isolated and underdeveloped area of the country. New cotton plantations will be established in the area to supply raw materials for the plant's spinning mill. At full capacity in 1979, the company will produce 20 million meters of cotton and synthetic fabrics. Approximately \$22.7 million of equipment was purchased from West Point Pepperell Inc. of the United States. All future equipment purchases will be made through international tenders. At capacity the company will operate 50,000 spindles and 939 weaving machines, and will employ 2,000 persons.

The Iranian machine-made shoe industry has grown very rapidly in recent years while the hand-made shoe industry has become smaller. A limited portion of the market will continue to be supplied by handmade shoes, and product quality will become more important in both segments of the shoe industry. Production growth in the Iranian shoe industry leveled off in the mid-1970's to about 10% annually. Two new producers, Ravaie Shoe Company (300,000 pairs per year) and Firooz Shoe Company (1.2 million pairs per year) will begin production by 1979 for the expanding export markets. Iranian exports to other than Eastern European countries have been quite limited in past years but significant sales are expected to Western European and U.S. markets by 1980.

Growth in production of ready-made clothing, a relatively new segment of the industry, will be very rapid during the late 1970's. There are many planned projects for production of ready-made clothing. The Imperial Organization for Social Services is planning a project to produce 1.5 million sets of work clothing (coats and trousers) in five manufacturing and distribution plants under construction in 1976. Each plant will have an annual capacity of 300,000 clothing sets, employ 144 persons, and cost \$1.7 million.

Knitwear production has grown rapidly both for domestic consumption and export. The trend in knitwear production is also towards larger, more capital-intensive plants, and smaller producers are being forced out of production. The larger knitwear producers offer wholesalers a steady supply, constant quality, and often discounts which make the small producers noncompetitive. Several existing knitwear

producers were undergoing expansion in 1977 and there were numerous new plants being planned.

Traditional hand produced textiles have also undergone changes during the 1966-76 period. During the latter part of the 1960's and early 1970's, demand, particularly for export, rose sharply for almost all types of handwoven and embroidered textiles. In order to meet this demand there was an inevitable decrease in the quality of workmanship. The Ministry of Cooperatives and Rural Affairs, through its agency the Iran Handicraft Center, has been active in assisting handicraft production and in setting standards for the industry. The traditional fabric block printing and finishing process, called Qualamkar fabrics, has undergone considerable consolidation. In 1960 there were over 40 Qualamkar printing and finishing workshops in the city of Esfahan. The number of persons engaged in the industry has remained about constant since that time, but by 1976 there were only 14 such establishments. However, the actual weaving of the cloth, done in homes in the Esfahan area, has not been consolidated. There is also a trend towards consolidation in the production of traditional brocade, Yezdi Termeh.

In all segments of the textile industry, the two strongest trends are towards higher production volume and greater integration. If the Government's plans for the country to become an important textile exporter are to succeed, the industry must become more efficient. Government protection policies have been effective in helping a relatively small industry develop. However, in 1976 the industry was rapidly approaching the point at which domestic demand could be met, and it will soon have to turn to export markets. It is expected that the Government will relax its protection policy and cause the industry to become more competitive. This may force some of the less efficient producers out of business, and other firms may consolidate even further.

## GROWTH PROSPECTS

The major trends in the Iranian textile industry are expected to continue during the 1975-85 period. During that time, it is expected that the following conditions will emerge:

1. Iranian textile production will surpass 1 billion square meters and will supply nearly all domestic demand by 1981 (see figure 1).
2. Industry integration will continue and about 15 major producers will dominate the industry from spinning through retailing of both textiles and finished clothing.
3. Exports of knitwear will grow to over \$50



million by 1980, and machine-made shoe exports will be double those in 1974.

4. Growth in exports of fabrics will be limited by high production costs; export subsidies will be necessary by the mid-1980's.

In 1975, just over 78% of domestic demand for textile fabrics was supplied by Iranian producers. By 1980 it is estimated that domestic demand for supply will be about equal. The growth prospects for the textile and garment industry are excellent. Investment will increase due to growing local demand plus government incentives aimed at making the industry a major export earner starting in the 1980's. Projections show investment growing from \$301 million in 1976 to \$379 million in 1980 with total investment for the 5-year period about \$1.7 billion. Exports will grow from \$137 million in 1975 to \$180 million in 1980. Most of this growth will be in knitwear and shoes.

Over 55% of investment in the industry will be spent for increasing capacity in the areas of synthetic fiber production, spinning, and weaving. The Government's plans call for textiles to become a major export earner for the country in the 1980's. In order to accomplish this, however, several problems will have to be resolved. One problem is a

general lack of experience in international market development. By 1976 the only significant Iranian textile exports had resulted from bilateral barter agreements with Eastern European countries. Iranian producers are not yet known in international markets, and if it were not for protective tariffs, Iranian producers could not compete in price or quality in the domestic market. The only advantage Iranian manufacturers had in 1976 was relatively low wages. However, since 1972, labor costs have been rising at 25% annually. At that rate, Iranian textile workers will earn as much as Italian and Japanese workers by the early 1980's. Because it is likely that productivity per Iranian worker will continue to be lower than that of the average European worker, the possibility of growth in Iranian textile exports will be limited unless additional government assistance is provided.

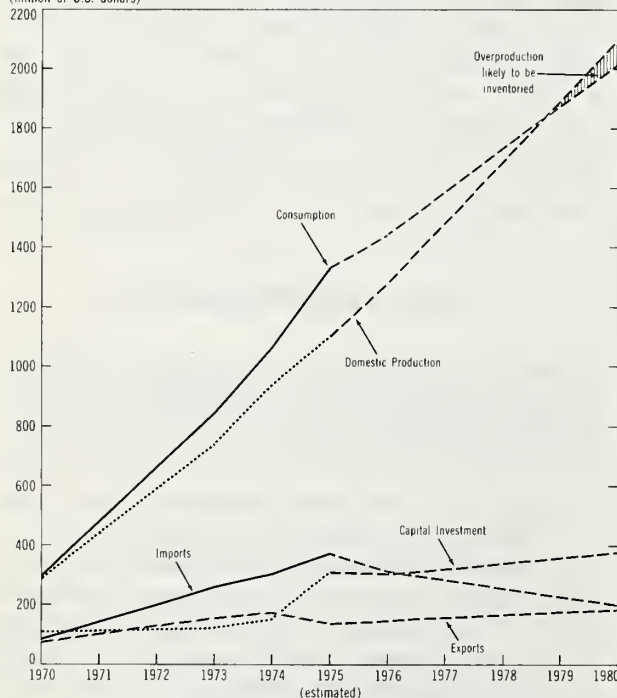
There appear to be some possibilities of increasing Iranian knitwear exports. However, like fabric producers, knitwear companies currently export only to Eastern European countries, and have not yet sold to competitive western markets. Iranian producers will have to become more responsive to international standards and style changes to increase their sales in world markets. However, the major impediment to increased exports is the high cost and relatively low productivity of Iranian labor. The Government has placed high priority on the growth of the knitwear industry and if government plans are not curtailed, there should be about \$400 million invested in the knitwear industry during the period 1976 to 1980. Exports of knitwear should grow from \$29.6 million in 1975 to \$52 million in 1980.

Industrial shoe manufacturers sold almost 11% of their total output abroad in 1975. Most of these sales were made to Eastern European countries. However, the major shoe manufacturing companies are beginning to develop sales in international markets, and have taken sizeable orders for export to countries in Europe and the United States. Exports of shoes are expected to grow from \$8.7 million in 1975 to \$14.5 million in 1980. Since the major Iranian shoe manufacturers are already almost totally integrated, from raw materials through marketing of finished products, the shoe industry seems the most likely to obtain substantial export orders during the next several years.

In the mid-1970's Iranian garment manufacturing was still mainly in the hands of individual producers. The industrially produced garment industry grew rapidly in the early 1970's and will continue to grow through 1980. As the production of large industrial garment manufacturers grow, many smaller producers may go out of business.

Figure 1  
Iran: Textile Consumption

(million of U.S. dollars)



Source: Ministry of Industry and Mines, Textile Syndicate of Iran, and estimates based on trade interviews.

## CAPITAL GOODS MARKET

The Iranian market for textile machinery and equipment grew from \$88 million in 1973 to over \$211 million in 1975. Total equipment demand is expected to exceed \$270 million annually by 1980 (see table 9). The main reason for this rapid growth has been the importance placed on the industry's development by the Government of Iran. A total of 450,000 new spindles were planned to be added during the 1973-78 period—over 50% growth in this measure alone. New textile plants in Iran will generally be large, fully integrated operations, and will require a great infusion of new textile equipment. Textile machinery imports for two large textile plant projects alone amounted to \$72 million in 1975. There is no manufacturing of textile equipment in Iran, and the market will be supplied entirely by imports. Only some ancillary equipment, such as conveyors, rollers, vats, and spare parts were being produced by Iranian manufacturers in 1976.

### Imports

Iranian imports of textile equipment grew 46% annually during the 1973-75 period. The major category of equipment imported during this time was spinning machinery, which grew from \$24 million in 1973 to over \$93 million in 1975. Spinning machinery represented 44% in value of all textile equipment imports. Weaving equipment was also in strong demand in Iran, with both plant expansion projects and new plants purchasing large quantities of looms. Weaving equipment valued at \$68 million entered Iran in 1975. Growth in imports of weaving equipment averaged 30% annually during the 1973-75 period, with the largest increase in 1975. Iranian imports of fabric finishing equipment doubled from 1974 to 1975. They amounted to \$36 million in 1975, 17% in value of all textile equipment imports. Imports of garment industry equipment increased 21% annually during the 1973-75 period, totalling almost \$14 million in value in 1975.

West German manufacturers were the leading suppliers of textile equipment to Iran from the early 1960's to 1976. During this time the market share of West German suppliers did not fall below 30%. In 1975, West German manufacturers sold a total of over \$91 million worth of equipment to the Iranian textile industry, 43% of total textile machinery imports that year. West German firms made especially large sales of spinning and finishing equipment.

Japanese manufacturers overtook British suppliers in sales of textile equipment to Iran for the first time in 1974 and maintained second position in 1975. Japanese textile machinery manufacturers sold equipment valued at \$28 million to Iran in 1975,

Table 9.—Iran: Size of Market for Textile and Apparel Manufacturing Equipment  
(in thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>SPINNING MILL EQUIPMENT</b>					
Imports					
United States .....	1,660	3,613	1,487	4,500	2,800
F.R. Germany .....	10,207	12,197	50,304	—	—
Switzerland .....	2,848	5,261	6,067	—	—
United Kingdom .....	2,579	5,167	14,282	—	—
France .....	3,397	1,093	2,602	—	—
Japan .....	96	766	5,816	—	—
Others .....	3,421	10,593	12,481	—	—
Total Market .....	24,208	38,690	93,039	93,750	119,500
<b>TEXTILE AND FABRIC PRODUCTION EQUIPMENT</b>					
Imports					
United States .....	1,788	2,706	1,655	4,800	5,200
F.R. Germany .....	20,568	15,262	18,350	—	—
Switzerland .....	5,879	7,117	11,199	—	—
United Kingdom .....	4,004	4,020	10,271	—	—
France .....	615	1,404	5,051	—	—
Japan .....	2,144	3,830	13,815	—	—
Others .....	1,578	5,939	8,006	—	—
Total Market .....	36,576	40,278	68,347	70,350	80,400
<b>TEXTILE AND FABRIC FINISHING EQUIPMENT</b>					
Imports					
United States .....	480	397	744	820	1,200
F.R. Germany .....	10,669	11,736	19,071	—	—
Switzerland .....	1,301	1,003	1,730	—	—
United Kingdom .....	740	1,015	1,805	—	—
France .....	308	526	3,107	—	—
Japan .....	422	884	2,948	—	—
Others .....	3,179	2,549	7,010	—	—
Total Market .....	17,099	18,110	36,415	33,270	43,500
<b>APPAREL AND OTHER TEXTILE PRODUCT MANUFACTURING EQUIPMENT</b>					
Imports					
United States .....	158	134	299	390	900
F.R. Germany .....	3,407	2,394	3,333	—	—
Switzerland .....	77	310	308	—	—
United Kingdom .....	208	408	271	—	—
France .....	77	290	390	—	—
Japan .....	3,215	5,786	5,157	—	—
Others .....	853	1,306	4,049	—	—
Total Market .....	7,995	10,628	13,807	17,830	27,100
<b>TOTAL TEXTILE AND TEXTILE PRODUCTS EQUIPMENT</b>					
Imports					
United States .....	4,086	6,850	4,185	10,510	10,100
F.R. Germany .....	44,851	41,589	91,058	—	—
Switzerland .....	10,105	13,691	19,304	—	—
United Kingdom .....	7,531	10,610	26,629	—	—
France .....	4,397	3,313	11,150	—	—
Japan .....	5,877	11,266	27,736	—	—
Others .....	9,031	20,387	31,546	—	—
Total Market Size .....	85,878	107,706	211,608	215,200	270,500

<sup>1</sup> Estimates.

Source: United Nations, Organization for Economic Cooperation and Development, supplier country, and official Iranian trade statistics; estimates based on trade interviews.



representing 13.2% of total market sales. Japanese loom manufacturers and clothing manufacturing equipment suppliers have made large sales in Iran. British suppliers held 12.6% of the Iranian market in 1975. British firms were especially strong in the sales of weaving and spinning equipment.

Sales of U.S. textile equipment suppliers in the Iranian market have been erratic. In 1975, U.S. sales to Iran amounted to just over \$4 million, only 1.8% in value of total imports for that year. U.S. equipment has generally not been competitive with European machinery since Iranian requirements have been for the lower volume types supplied from Europe. Very little effort has been made by U.S. suppliers to increase sales, and the U.S. market share for 1976 was expected to be less than 1% by value of the total import market. The market share of U.S. suppliers is expected to rise to 5% by 1978 mainly as a result of the formation of a joint venture between an Iranian company and the U.S. firm, du Pont, and the construction of a large plant which will include a considerable amount of U.S.-supplied equipment for fiber extrusion. The new plant will have little effect on U.S. market share after all machinery has been installed by 1979. It is expected that by 1980 the U.S. manufacturers will only supply 4% of Iran's textile equipment imports.

It is estimated that Iran's textile production capacity will expand about 50% during the 1976-80 period. Iran's textile equipment imports are projected to reach a value of \$270 million by 1980. The highest growth rate is expected in the shoe and garment segments of the industry. Garment production industry growth is projected at an annual rate of 20% during the 1976-80 period, and imports of equipment for garment production valued at \$30 million are estimated during 1980.

## Domestic Suppliers

Most large Iranian textile plants have their own workshops for equipment maintenance and production of basic spare parts. Some ancillary equipment used by textile manufacturers, such as boilers and dyeing vats, are now made in Iran. It is not expected that any textile or garment-making machinery will be made in Iran during the period covered by this survey.

## MARKET OPPORTUNITIES

Iran's textile market offers a wide variety of market opportunities for firms specializing in quality equipment. The following categories of equipment will be in greatest demand during the 1975-1980 period:

will be in greatest demand during the 1975-80 new plant investment will offer market opportunities for the sales of sizing, dyeing, and carding equipment. New nylon and synthetic fiber plants will spur the growth of fiber extruding equipment. Equipment with high capacity will be purchased, but the bulk of equipment needed will be of lower speed and capacity which is easy to service in the country. There will be a greater emphasis on finishing equipment in the late 1970's as competition forces smaller firms to upgrade the quality of their finished cloth.

**Knitting Equipment.**—Iran's market for knitting equipment will remain somewhat strong in the 1975-80 period. However, new firms being established will be of small capacity. Round nut knitting machinery will be in greatest demand.

**Garment Industry.**—The equipment used in the readymade garment industry will consist of fabric cutting equipment and industrial sewing machines. Sophisticated equipment such as high capacity fabric cutting presses, laser guided cutting equipment and very high speed industrial sewing machines will not be purchased in Iran until the end of the 1970's.

**Shoemaking Equipment.**—The 1976-80 period will mark the first appearance of very high speed leather cutting equipment in the Iranian shoemaking industry. Industrial stitching equipment and punching equipment will also be in good demand.

Iran's textile industry is not expected to obtain assistance in technical consulting and marketing from firms specializing in such services. Most Iranian textile producers obtain needed technical assistance directly from foreign equipment suppliers. While large textile producers have their own machinery repair facilities, smaller companies usually do not, and consequently a need is developing for the maintenance of small to medium-sized textile machinery. Most small textile and garment manufacturers have little concern for maintenance of their equipment, and normally do not include maintenance clauses in their purchase contracts.

## MARKETING ENVIRONMENT

### Buyers' Universe

Because both public and private organizations are involved in Iran's textile industry, there are a variety of ways that purchase decisions for equipment are made. In the textile industry, there are over 100 decisionmakers, almost all of whom are company owners. Private Iranian textile producing companies typically grew out of the activities of textile and textile commodity merchants. Virtually all large private firms are owned and controlled by an individual entrepreneur or his immediate family. Many of these

firms have grown much larger than their original size, but ownership and control have generally not changed. Typically, in a private spinning, weaving, garment making or shoe production firm, the key purchaser is the owner of the company. In companies such as Melli Shoe Co., Sanaye Poushesh Iran, Yazdbaf, and Bella Shoe Co., the owner makes purchasing decisions for all plants under his control.

In the mid-1970's what might be termed a "new generation" of corporately owned and managed private textile firms emerged. Many of these firms are implementing or planning expansion into large capital intensive projects. An example of one of three new textile production firms is the Polyacryl Iran Company which has grown out of the large, successful conglomerate, Behshahr Industrial Group. Such firms as Polyacryl Iran have a much wider ownership base and often include a foreign partner. Procurement decisions are often made through a much more formalized system involving inputs by production, marketing, and financial managers. In cases where banks or government development organizations hold equity positions, they may also take part in decisions for capital expenditures.

The Government has divested itself of many of its holdings in the textile industry, although there were still five government factories operating in 1977. Equipment procurement for government factories is usually done through international tenders. Machinery specifications must meet the basic requirements of the government buyer, but after that price is the most important single factor.

## Foreign Suppliers' Universe

There are approximately 40-45 main suppliers of textile equipment to Iranian industry. The majority of these companies are European. There are only a few U.S. and Japanese textile equipment suppliers represented in Iran (see table 10).

Several companies have particularly good reputations among Iranian textile producers for the high quality of their specialized equipment. For example, Beninnger Company of Switzerland sells approximately 15% of all textile sizing equipment in the country. Allen West Limited of Britain supplies a large portion of Iran's carding equipment needs and The Platt-Saco Lowell Co., a division of Stone-Platt Industries Ltd., also of Britain, is a leading supplier of complete textile plants. Japanese suppliers active in Iran include Toyoda Co. which sells a large portion of Iran's drawing looms and O.K.K. which is a leader in the supply of spinning frames. West Germany, which has by far the largest share of the textile equipment market, has several strong suppliers represented in Iran. Ingolstad GmbH, is the market leader in sales of carding equipment and spinning frames. Goller GmbH provides a large portion of

**Table 10.—Iran: Leading Suppliers of Textile Equipment**

---

<b>WEAVING EQUIPMENT</b>	
Toyoda Co. (Japan)	
Ruti S.A. (Swiss)	
Sauver S.A. (Swiss)	
Draper Corp. (U.S.A.)	
Dornier GmbH (West Germany)	
<b>DYEING/BLEACHING MACHINERY</b>	
Goller GmbH (West Germany)	
Platt-Saco Lowell Ltd. (U.K.)	
Monfort A.G. (West Germany)	
<b>PRINTING/DOUBLING</b>	
Mensel GmbH (West Germany)	
Memgen GmbH (West Germany)	
Menzel GmbH (West Germany)	
Platt-Saco Lowell Ltd. (U.K.)	
Zimmer A.G. (Austria)	
Stork B.V. (Holland)	
<b>CARDING EQUIPMENT</b>	
Allenwest Ltd. (U.K.)	
Ingolstad GmbH, (West Germany)	
Crossroll Ltd. (U.K.)	
Marzoli S.p.A. (Italy)	
<b>SPINNING EQUIPMENT</b>	
O.K.K. (Japan)	
Platt-Saco Lowell Ltd. (U.K.)	
Reiter S.A. (Switzerland)	
Zinser GmbH (West Germany)	
<b>SIZING/DESIGNING EQUIPMENT</b>	
Beninnger S.A. (Swiss)	
West Point Pepperell Inc. (U.S.A.)	
Sucker GmbH (West Germany)	
Goller GmbH (West Germany)	

---

Iran's needs for dyeing and bleaching machinery. Schlafhos GmbH supplies approximately 30% of Iran's warping equipment, while two other West German companies, Mensel GmbH and Memgen GmbH supply approximately half of the doubling equipment sold in the country. The West German firm, Zimmer GmbH, is designing and supplying the machinery for the Parsylon Company's \$19 million nylon plant in Iran. Only two U.S. companies regularly supply the Iranian textile machinery market. The Singer Co. is a successful supplier of the market for industrial sewing machines and West Point Pepperell, Inc., supplied carpet making equipment to Iran for the first time in 1976. Draper Co., a subsidiary of Rockwell International, sold over \$1 million worth of textile equipment in 1973 and was bidding on some of the larger textile projects in 1976.

The majority of textile machinery imported during recent years has been for use in new textile plants. Because Iranian textile companies often obtain good financing terms through government development banks, they do not usually need supplier financing. A very important factor, however, is delivery. West German companies have maintained an excellent reputation for fast equipment delivery time. The British firm Platt-Saco Lowell Co., Limited also has a good reputation for reliability in



delivering equipment to Iranian textile companies. Japanese firms such as Toyoda Co., Nissan Co. and Osaka Mira Co. are known for the low prices of their equipment, but also maintain a good reputation for delivery.

## Marketing Factors

Textile equipment is most often purchased directly from foreign manufacturers. Iranian buyers often travel to the manufacturer's plant to check performance of the equipment they are planning to purchase. Potential buyers of new equipment often consult with associates in the textile business to obtain firsthand information on machinery performance. Many potential buyers seek out textile trade shows in Europe, Japan, and the United States to look at the latest equipment. Two prime considerations for Iranian buyers are whether or not the equipment is going to be hard to service, and if the equipment's capacity is appropriate for the buyers.

Price is also a critical factor in equipment sales, especially among buyers who are not going to use a machine at its full capacity. Price is an important factor in sales of sewing machines and smaller equipment for shoe and knitwear manufacturers, but is not as critical for sales of textile spinning and weaving equipment. For large sales, delivery, and product reputation are as important as price.

Almost all foreign suppliers provide installation services, fast delivery of spare parts, and warranties on equipment sold. Typically, manufacturer's representatives make periodic sales trips to Iran for personal calls on potential buyers. Most manufacturers have also appointed marketing firms in Iran to identify potential buyers, and to notify the manufacturer of sales opportunities. A successful sale normally brings a 2% to 3% commission to the Iranian marketing firm. Textile producers do not feel that it is necessary to obtain large numbers of bids for equipment supply, but are normally satisfied with bids from two or three foreign suppliers with whom they are familiar. A supplier's reputation is very important in Iran, since there are no trade publications or regular trade exhibitions in the country. Two associations which are sources of information and contacts in the textile industry are the Iranian Syndicate of Foremen in the Synthetic Fiber, Cotton, and Textile Industries, located at 5 Kandovan Street off

Shahreza Avenue in Tehran and the Iranian Woolen Industries Owners Syndicate located in the Keshmir Building on Serah Shah Avenue in Tehran.

## COMPETITIVE POSITION OF UNITED STATES SUPPLIERS

If present trends continue, by 1980 it is expected that U.S. suppliers will have raised their total market share in textile equipment sales from 1.8% in 1975 to about 4%. U.S. suppliers have found themselves in this unenviable position because they have done insufficient direct selling and because they have been unable to compete with European and Japanese suppliers on both pricing and delivery. These factors are some of the major barriers to increased sales. A great deal of business done in Iran is based on long-term associations; Iranian buyers have had long-term relationships with many European suppliers, particularly those from West Germany. Many sales are lost to American firms because they do not have the necessary representation in the market required to effect such personal communications with interested customers.

A move by U.S. firms from an inactive role in Iran to one of active participation in the growth of the industry could increase their market share to at least 10% by 1980. A key factor will be their ability to demonstrate the applicability of high volume, close tolerance U.S. textile equipment to the needs of the developing Iranian textile industry. Opportunities for U.S. suppliers should increase as Iranian manufacturers seek to produce for an increasingly competitive and quality conscious market, and particularly if there are moves toward implementing the Government's plans for textile exports. Another factor favorable to increased sales by U.S. firms is the trend toward large scale, capital intensive textile projects which are corporately owned and managed. Establishment of effective and permanent representation coupled with adequate installation and aftersales service capabilities will be critical factors in improving the market share of U.S. manufacturers. One approach which may be effective for U.S. textile equipment firms is the establishment of marketing and service consortia by groups of companies producing compatible equipment lines.

# Transportation

IRAN'S TRANSPORT system comprises 52,000 kilometers of roads, 5,300 kilometers of railways, 14 airports at major population centers and numerous others at smaller towns, four major oil ports, and six major general cargo ports. The system has routes linking the capital city, Tehran, with the main external sea and land trade routes which enter the country at Khorramshahr/Bandar Shahpur at the head of the Persian Gulf, Tabriz to the northwest, and Mashhad to the northeast. Distances along these routes are great and the country's topography is characterized by rugged mountain ranges and large desert plains. With the exception of a navigable stretch of river near Khorramshahr, Iran has no inland waterways. This factor, plus the limited railroad system, makes road transport the most important means of long-range bulk transport.

The two major forces shaping the demand for transport service are the powerful growth in imports financed by the foreign exchange earnings of the oil exports, and the Government initiatives to develop industry in regional centers other than Tehran. The physical and economic environment creates difficult problems in the development of the transport system. These problems have not been satisfactorily dealt with in the past due to lack of coordination and delays in the implementation of construction programs.

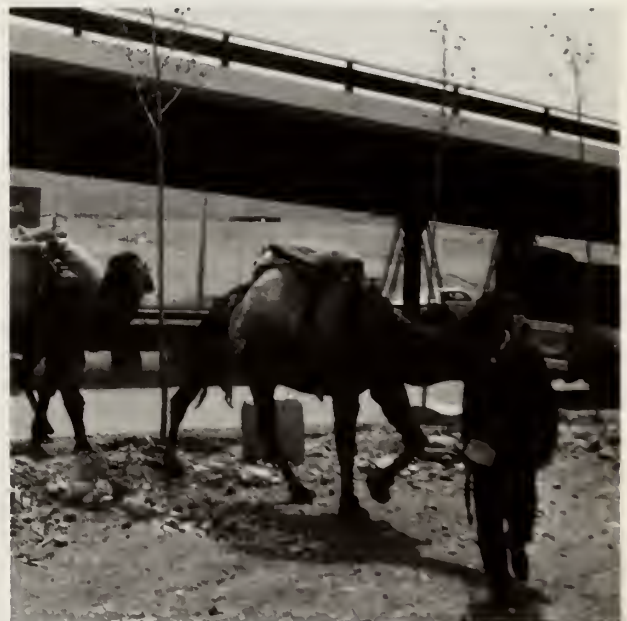
The high cost of delay in the development of the transportation system is evidenced by congestion in Iran's ports. Further costs are incurred by inadequate maintenance of existing facilities, especially highways. About \$7.3 billion was allocated for investment in transportation systems during the Fifth National Development Plan (1973/74-1977/78), of which 82% was to be by the public sector. Of this total investment \$2.3 billion was planned for roads, \$1.2 billion for railroads, \$918 million for airports, \$207 million for overland transport, \$1.9 billion for shipping, and \$366 million for air transport.

Progress in developing an integrated transportation policy has been made through the national planning process. The Ministry of Roads and Transport, established in 1930, is responsible for the construction and maintenance of all roads, railroads, and ports. The Ministry controls the Organization for the Coordination of Transportation whose responsibilities presently include development of transportation

statistics, and coordination of projects undertaken by the Ministry of Roads and Transportation. Ports are operated by the Ports and Shipping Organization, a semiautonomous commercial entity under the Ministry. The Ministry holds the Government's shares in the Iranian National Railways Corporation, established when the National Iranian State Railways were reorganized into a joint stock company in 1977. Separate state corporations operate the national shipping and aircarriers, while the Civil Aviation Authority is under the Ministry of Defense.

The market for transportation equipment totaled \$1.86 billion in 1975 of which \$1.68 billion or 89% was imported. U.S. suppliers exported transportation equipment to Iran valued at \$630 million in 1975. Automotive components and vehicles made up 46% of all U.S. supplier sales; airplane parts and components totalled an additional 50%. U.S. suppliers sold very small amounts of both marine and railroad transportation equipment.

Iran's transport equipment market is expected to grow to over 2.9 billion in 1980, of which 2.2 billion or 76% will be supplied by imports. Sales by U.S. suppliers should rise to \$630 million in 1980.



*The camel is rapidly disappearing from the Iranian scene as new highways are developed to move goods and people.*



# Road Transport

## SYSTEM, STRUCTURE, AND SIZE

Most of the development of Iran's road network has occurred since the end of World War II. The majority of Iran's population lives in the northern and western parts of the country. Most of the major cities in these areas are connected by a highly developed road network. The road system is strongly influenced by the topography of the country, the center of which contains a vast desert region. The road network principally follows its circumference, with only a few roads crossing it. Almost all major arteries follow ancient caravan routes.

In 1975 there were approximately 52,000 kilometers of roads in Iran, 36% of which were concrete or asphalt paved, while 41% were gravel surfaced (see table 1). The remainder were unimproved roads, many of which become impassable during winter. Most of the country's paved roads have two lanes. The first four lane expressway was completed in 1967 between Tehran and Karaj, some 40 kilometers to the west. Over \$745 million was spent on the extension and improvement of the highway system in 1975.

In 1975 Iran's 176,000 trucks transported almost 80% of the country's inland cargo. During the same year the country's 62,000 buses carried over 7.3 million passengers more than 131 million miles. There were approximately 646,000 passenger cars on the roads in 1975; 70% of which were registered in Tehran.

Six domestic manufacturing plants assembled more than 97,000 passenger cars in 1975. With expansion plans already underway, it is expected that annual

production by these six manufacturers will reach 263,000 cars by 1980.

The largest assembler of automobiles in the country is Iran National Manufacturing Company. Established in 1962, the firm began assembling British Hillman automobiles under license from Chrysler Corporation of the United Kingdom in 1967. In the 8 years following the start of production the firm assembled over 239,000 automobiles, called the "Peykan" in Iran. Nearly 60% of all locally manufactured automobiles on the road were "Peykans." By 1980, it is expected that the cumulative number of automobiles manufactured by Iran National will total close to 900,000, representing over one-half of Iran's total automobile population.

Other major automobile manufacturers include Iran Citroen Company, a joint venture company in which Citroen Cie. of France owns a minority interest. It produced 22,000 "Citroen" automobiles in 1975. General Motors Iran, a joint venture owned 49% by General Motors Corp. of the United States, produced 8,000 Opel automobiles in 1975. Jeep Iran manufactured 9,800 "Willys" jeeps in 1975. In 1976, production of the French Renault model TL5 was initiated in the Iran Citroen plant and the manufacture of "Citroens" was discontinued. An estimated 13,000 "Renault" automobiles were assembled in 1976; a great number of this total was imported as semi-knocked-down (SKD) units.

## Public Transportation

There were a total of over 62,000 buses and "minibuses" operating in Iran in 1975. Five domes-

**Table 1.—Iran: Road Transportation Development**

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>KILOMETERS OF ROAD</b>						
Paved .....	11,061	13,995	16,022	18,720	21,666	36,600
Gravel .....	18,926	14,008	26,000	21,320	23,334	31,500
Dirt .....	8,183	17,003	6,665	11,960	13,340	11,500
Total .....	38,170	45,006	48,687	52,000	58,340	79,600
<b>VEHICLE POPULATION (000 UNITS)</b>						
Passenger Cars .....	203.6	392.5	503.5	646.4	824.0	1,340.0
Trucks .....	43.0	101.6	139.4	176.5	228.0	517.4
Buses .....	41.3	53.2	57.7	62.0	67.0	95.8
Total .....	287.9	547.3	700.6	884.9	1,119.0	1,953.2
<b>LOCAL MANUFACTURING OUTPUT (000 UNITS)</b>						
Passenger Cars .....	21.8	52.3	73.0	97.9	131.2	263.0
Trucks .....	5.4	20.2	24.5	30.4	42.4	82.5
Buses .....	2.1	3.0	3.3	3.4	4.9	8.0
Total .....	29.3	75.5	100.8	131.7	178.5	353.5
CAPITAL EXPENDITURES (million U.S.\$) .....	112.0	194.5	529.7	448.3	586.0	700.0

Source: Bank Markazi Iran, Ministry of Roads and Transport, Official Government Budgets; vehicle population through Iranian Auto Registration Bureau.

tic manufacturers assembled 3,400 vehicles in 1975. The largest bus producer is Iran National Manufacturing Company, which has assembled buses under license from Mercedes-Benz AG. of West Germany since 1963. By 1980, there is expected to be a total bus/minibus population in Iran of just over 65,000 with the Iran National Manufacturing Company accounting for over 53%.

Public bus service in Tehran is provided by the United Bus Company, a public transportation company formed in 1956 by the Tehran Municipality. The company has about 3,000 buses, 300 of which are kept in reserve, while 1,800 are used on 151 regular city routes. Each bus operates 16 hours per day. The remaining 900 are either unserviceable or under repair. In 1976 the company employed 5,000 bus drivers, 3,000 conductors, and 1,748 ticket sellers. The company operates its own maintenance facilities.

The largest privately owned passenger bus company in Iran is the Tehran based T.B.T. Company. It was established in 1954. The company operates a fleet of about 100 buses, mostly domestically assembled, air-conditioned Mercedes-Benz vehicles. In addition to its own buses, the firm also operates over 100 additional buses by contracting with independent owner-operators. T.B.T. operates daily bus services from Tehran to Shiraz, Kerman, Bandar-Abbas, Tabriz, Khorramabad, Abadan, and Kermanshah, as well as from Kermanshah and Esfahan to Abadan. The company also provides weekly service to Istanbul, Turkey, and Munich, Germany.

T.B.T. is also engaged in two joint venture trucking operations, the Iran-Hungary Company and the Iran-Bulgaria Company, and owns a total of 90 trucks which operate between Europe and Iran. Internal service is provided by 40 trucks owned by the company (some refrigerated), which primarily transport foodstuffs and dairy products on routes to Abadan, Ahvaz, Khorramshahr, Mashhad, Esfahan, and Zahedan. T.B.T. and its joint venture trucking affiliates augment their fleets when necessary by contracting with owner-operators on a "trip-by-trip" basis. T.B.T. has sales agencies in several major cities in Iran and West Germany.

## Trucking

The total population of trucks and vans in Iran reached 176,000 in 1975; over 30,000 were  $\frac{3}{4}$ -ton trucks and vans. By 1980 the truck population is expected to total over 517,000. Of this amount 450,000 will be locally assembled vehicles, while the remainder will come from imports. There are six domestic truck manufacturers. By 1980, an additional two firms are expected to begin operations. The major producers of heavy trucks, are Khavar

Company, which produces under license from Mercedes-Benz of West Germany, and Iran Kaveh which produces under license from Mack Truck Company, a division of Signal Industries Co. (U.S.). Together these two firms produced 7,200 heavy trucks during 1975.

The major domestic manufacturer of pickup trucks is Mazda Co. (Toyo Kogyo Ltd., Japan), which began assembly operations in 1969. It assembled an estimated 18,000  $\frac{3}{4}$ -ton trucks in 1975, and has an expansion program underway to boost production to 50,000 trucks annually by 1980. By that time, Mazda will have produced 261,000 pickup trucks representing over 58% of the total light truck population in the country.

Historically the Iranian trucking industry has been highly fragmented, being made up primarily of small fleets and owner-operators. There were few integrated companies joining truck fleets, freight agency, warehouse, and maintenance operations. Independent garage operators often acted as middlemen between truckers and shippers, arranging shipments, consolidating loads, and performing other freight agency functions. A Union of Truck Owners and Freight Agencies Syndicates were formed in 1970 under government encouragement to consolidate the 37 truck operator and 13 garage owner syndicates existing at the time. These syndicates were able to control routes, set rates, and extract high commissions, as well as restrict entry of new firms into the industry. As a result, the industry was insufficiently developed to handle the massive influx of goods which began to pour into Iran in 1973, as development began to accelerate following the increase in petroleum prices.

The Government initiated several actions beginning in 1973 to stimulate the development of the trucking industry. These included the direct import of trucks and trailers for distribution to government agencies and sale to private operators, the development of public warehousing facilities, and the establishment of government-owned trucking organizations. In early 1975 the Government reversed previous policy and authorized the import of used trucks during a period extending through March 21, 1976. While the number of available trucks increased significantly, and the industry moved between 22 and 25 million tons of freight in 1975, shortages of drivers, trained maintenance personnel, and maintenance facilities have continued to hinder expansion of the industry.

The Iran National Transport Company (INTC) was formed in July 1974 by The Ministry of Roads and Transport to augment available private trucking services, handle government cargo arriving in Iranian ports, and manage the import and distribution of trucks imported by the Government. INTC placed orders with International Harvester Co. and White



Motors Co., both of the United States, for a total of 4,000 tractors and 12,000 semitrailers (8,000 flat-bed and 4,000 van types), to be delivered in increments over a 4-year period beginning in 1974. INTC initiated a program to recruit and train drivers and develop them into independent owner-operators working on a contract basis. The program uses a payroll deduction plan through which the drivers can purchase the trucks from the company. During INTC's first 9 months of operation the company received a total of 740 tractors and 2,758 trailers, of which 235 tractors were put into operations. The first 250 trucks, received before the firm was ready to go into operation, were sold to private sector operators and to other government organizations. Additional trucks have subsequently been channeled to private and government users through INTC as part of the Government's efforts to bring about the rapid development of the industry.

INTC serves two principal routes: Bandar Shahpur/Khorramshahr-Tehran, and Bandar Abbas-Tehran. Facilities in operation or planned by the firm include major terminals with parking, loading and unloading facilities, and maintenance shops at Tehran, Khorramshahr, Bandar Shahpur, and Bandar Abbas, and midway terminals on both routes; en-route resthouses, restaurants and small repair facilities; and a computerized system for scheduling, routing, cargo inventory, vehicle and maintenance control, and other management functions. The U.S. truck suppliers agreed to establish, equip, and operate service facilities in Iran capable of maintaining and repairing the equipment they had sold, and approximately six American technicians were sent to Iran for this purpose.

The Iran Tanker Transport Company, another company organized in 1974, has dealt with the shortage of available Iranian drivers by hiring drivers from abroad. The firm employs about 900 people, including 500 Korean truck drivers hired under contract through the Korean Overseas Development Company. Each contract driver receives a base salary of \$625 per month, and is eligible for a bonus for driving over 12,000 kilometers during the month. The company also contracts for trucks with other firms and independent owner-operators as required. The use of contract drivers has not been entirely successful for the firm. Iran Tanker has experienced a high level of breakdowns, and its trucks and drivers average fewer kilometers per month on the road than is the case with other trucking companies. The contract drivers do not have the same incentive as the owner-operators to maintain their vehicles and to work. While owner-operators average four round trips monthly between Bandar Abbas and Tehran, the contract drivers average only three. In 1976 Iran Tanker's fixed capital assets were \$15.4 mil-

lion. The firm had plans to acquire 500 Mack and Daimler Benz trucks, as well as to invest about \$450,000 for terminal and maintenance facilities and equipment. In 1976 Iran Tanker, with the encouragement of the Ministry of Commerce, joined 10 other trucking firms to form a new company, Bar Va Anbar Co. The new company was to be given a major responsibility for unloading and transporting goods imported by the Government. Other firms involved in the new joint operation include Tehran Khorramshahr Express Co., Iran Sonat Co., and Hamb Va Naghl Bozongh Iran.

There have been a number of efforts to deal with the problem of insufficient warehousing and storage space. The Public Warehouse Company, owned by Bank Meli, other government and private banks, and the Bimeh Iran Insurance Company, operates warehouse and storage facilities in Julfa and Astra on the Soviet border, as well as at Tabriz, and Tehran. The firm's Tabriz warehouse includes 2,400,000 square meters of covered and open storage area. The Tehran warehouse includes 450,000 square meters of storage space and cold storage facilities with a capacity of 4,000 tons. In 1976 Public Warehouse Co. began construction of new facilities covering 180,000 square meters in Tehran, including an automobile storage area, offices, restaurant facilities, a bank, and additional cold storage area with a capacity of 4,000 tons, expandable to 8,000 tons. The firm also has plans to develop facilities in Khorramshahr, Bandar Shahpur, Bandar Abbas, and Esfahan. The firm owns land south of Esfahan with an area of 559,000 square meters where it plans to build a warehouse.

### **Independent Repair Facilities**

In 1975 there were an estimated 4,200 independent automotive garages in Iran; about one-half are located in Tehran. Most of the shops have only basic equipment and little in the way of specialized tools or diagnostic equipment; most lack trained mechanics. In addition to the shortage of trained mechanics, government price controls initiated in 1975, which regulate costs of auto repair, have restricted the development of a modern automotive maintenance and repair industry. Most passenger vehicle and truck manufacturers, assemblers, and importers also operate servicing facilities in Tehran and the provinces.

### **Principal Government Offices**

The Ministry of Roads and Transport is the principal government organization responsible for maintenance and construction of new roadways in the country. The Ministry of Roads contracts all proj-

ects involving any intercity road construction. Municipal authorities are normally responsible for providing public transportation services and maintaining road networks within cities. For example, the Tehran Municipality operates the United Bus Company cited previously, and maintains the city road system.

The Ports and Shipping Organization is the main body controlling inland freight. This organization fixes trucking rates and also owns a large fleet of transport trucks for use in clearing goods from congested ports. The National Iranian Oil Co. has built and maintains a 527-kilometer road system in the southern part of the country, to facilitate work in the gas and oil fields.

## **TRENDS, PROGRAMS, AND PROJECTS**

As recently as 1962, there were less than 100,000 cars in Iran. However, with the increase in discretionary income, and with the emphasis the Government has been placing on developing domestic automobile manufacturing, Iran's vehicle population expanded dramatically in the early and mid-1970's. Output of domestically manufactured cars cannot keep pace with demand, and Iran still imports 40,000 to 50,000 cars yearly.

The growing volume of Iran's imports has made it necessary for the Government to undertake action to stimulate the expansion of the trucking industry, including importing and distributing vehicles, rationalizing the structure of the industry, and actually establishing state-owned trucking firms.

Roadways have not expanded at a rate sufficient to handle the increased traffic. As a result, highways leading to Tehran from the southern and northern ports of entry are congested with a large volume of truck traffic. Traffic congestion, from both commercial and private passenger vehicles has resulted in rising accident rates. The other major problem has been the shortage of trained drivers and mechanics.

The Fifth National Development Plan (1973/74–1978/79) envisioned total fixed investment in road transport of \$2.5 billion; \$1.9 billion was to be for construction and expansion of highways, major and secondary roads; \$370 million for maintenance and repairs; and \$207 million for overland transport. The objective of the road development plan is to link population, agricultural, industrial, and mining centers with markets; land and sea entry ports with points inland; and to provide access to tourist areas. The plan foresaw completion of 2,400 kilometers of highways begun during the Fourth Plan period (1968/69–1972/73), and the initiation of work on another 3,800 kilometers to be completed during the

Sixth Plan period beginning in 1978. In addition, 3,500 kilometers of feeder roads begun during the Fourth Plan period is to be completed, while work will begin on an additional 15,500 km of feeder roads, of which 8,000 were to be completed during the Fifth Plan period.

In addition to road construction and maintenance, the Fifth Plan outlined a number of other programs to be undertaken by the Ministry of Roads and Transport to improve operating efficiency and maintenance, and as support services to the private sector. Three new organizations are to be created by the Ministry, a Road Maintenance and Construction Research Center to conduct research into construction and maintenance techniques, materials, etc., an Engineering Services Institute, and a Road Machinery Cooperative through which equipment is to be rented by private contractors. The Ministry's soils laboratory is to expand its facilities and make available soil testing services to road contractors in provincial areas. More precise regulations on axle weights and vehicle standards are to be set, and increased supervision of road use is to be implemented by the Ministry's Road Maintenance Organization.

The program for overland transport included the purchase of 2,000 trucks and 6,000 trailers; the creation of a string of truck terminals and repair stations; and a statistical survey of road haulage traffic to facilitate road transportation planning and development.

During 1973/74–1976/77 the Government spent an estimated \$1.7 billion on road projects, and by the end of 1976 had completed approximately 13,300 kilometers of construction. Increased traffic and cargo hauling requirements necessitated shifting priorities and revising proposed projects. Improvement of the Tehran-Bandar Abbas road link, and a new Tehran-Bandar Shahpur road were given top priority. Although proposed capital expenditures of the Fifth Plan are likely to be met or exceeded, many major road projects have been deferred until the start of the Sixth National Development Plan (1978/79–1982/83). Over 3,500 kilometers of dirt feeder roads were upgraded to gravel or asphalt paved roadway, while major two-lane highways between population centers rose from nearly 14,000 kilometers to over 21,000 kilometers by the end of 1976. The building of large expressways throughout the country had started by the beginning of the Fifth Plan period, and major expressways are planned for the Sixth National Development Plan period.

### **Projects**

Over 2,500 kilometers of highways were under construction or design in 1977 (see table 2). The



**Table 2.—Iran: Road Construction Projects Being Implemented, 1977**

Location	Type of Construction	Length	Cost (million \$)	Contractor Status
Northeast .....	Mashhad-Birjan Highway	470 km	N.A.	Pars Consulting Co.
South Central .....	Esfahan-Shiraz Highway	360 km	N.A.	Design Stage Tender
East Central .....	Zanjan-Divandareh Highway	200 km	N.A.	Pars Consulting Co.
North Central .....	Damavand-Shahi Highway	150 km	N.A.	Pars Consulting Co.
North Central .....	Tehran-Qom Expressway	140 km	78.1	Mojm Co. & Beja Co.
Central .....	Esfahan Beltway	96 km	129.2	Ramp Consultants Co.
North Central .....	Tehran-Karaj Expressway	70 km	35.5	Completion July 1977
	Extension			
Central .....	Airport Expressway	16 km	15.6	Ramp Consultants Co.
Central-Southwest .....	Qom-Bandar Shapur, 4-lanes	1,000 km	N.A.	Morrison Knudsen International— French Consortium

Source: Fifth National Development Plan, Ministry of Roads and Transport, trade interviews.

major project is the building of a 4-lane, 1,000-kilometer road from Qom near Tehran, to Bandar Shapur in the south. Morrison-Knudsen International Corp. (U.S.) and a French consortium have the design contract and were expected to sign the construction contract in mid-1977. The Ministry was also building an addition to the 6-lane Tehran-Karaj expressway, slated to be completed in the summer of 1977. This project calls for the extension of the road an additional 70 kilometers at a cost of over \$35 million. The Tehran-Qom road is being widened to a 6-lane highway; the 140-kilometer project will cost \$78.1 million.

Small feeder roads and secondary roads were being designed by Pars Consulting Company from Damavand to Shahi, Mashhad to Birjand, and Zanjan to Divandareh totaling over 920 kilometers. The design work was slated to be completed in late 1977. In addition, Ramp Consulting Company was working on a 96-kilometer circular road around Esfahan. The Esfahan Beltway will cost over \$229 million. The firm was also handling a 16-kilometer freeway from Esfahan to the Esfahan Airport. This road is scheduled to be completed in the summer of 1977 and will cost over \$15 million.

A number of other road projects initially slated to be started during the Fifth Plan have been given new priorities and deferred to be implemented during the Sixth and Seventh Plans. The Ministry of Roads and Transport expects to begin implementation of projects totaling over 1,700 kilometers and valued at about \$213 million during 1977-80. An additional 2,700 kilometers of roads costing nearly \$370 million will be constructed during 1981-85 (see table 3).

## GROWTH PROSPECTS

The Iranian Government did not anticipate the great increase in the number of vehicles which occurred since 1973. The Ministry of Roads and Transport reacted by initiating stopgap measures to

**Table 3.—Iran: Major Road Projects To Be Implemented During the 1977-85 Period**

Projects	Length in Kilometers	Estimated Cost (millions of U.S. dollars)
<i>1977-80 Projects</i>		
Damavand-Firuzkuh-Zirab .....	150	36.9
Shiraz-Sirjan .....	360	22.7
Widening of Tehran-Saveh Road ...	70	21.3
Astara-Ardebil .....	100	21.3
Sananda-Hamadan .....	157	17.4
Qazvin-Bu' in-Saveh .....	155	17.0
Widening of special Karaj Road ...	40	17.0
Rafsanjan-Sarchesme-Khatunabad ..	100	17.0
Shahrud-Shahpasand .....	130	12.8
Surfacing of Yazd-Kerman Road ...	320	9.9
Marand-Jolfa .....	70	8.9
Kerman-Zarand .....	90	7.1
Sarbandar-Bandar Shapur .....	15	3.9
Dezful-Andimeshk .....	7	.6
Total .....	1,764	213.8
<i>1981-85 Projects</i>		
Varamin-Shahrud-Mashhad .....	830	142.0
Widening-Caspian Coast Road ....	320	63.9
Fuman-Mianeh .....	200	42.6
Birjand-Zabol-Zahedan .....	440	35.5
Shurgas-Azhedan-Mirjaveh .....	300	24.1
Rudan-Sabzevaran .....	173	24.1
Sirjan-Shahre Babak-Anar .....	207	15.6
Takestan-Shahdashte .....	154	9.7
Karak-Bojnurd .....	25	5.5
Rudhen-Darkhevin-Ab'Ali .....	31	3.4
Kerman-Mahan .....	31	2.9
Total .....	2,711	369.3

Source: Fifth National Development Plan, Ministry of Roads and Transport, trade interviews.

facilitate traffic flow, while basic planning was developed for longer term projects. By 1975, contracts for construction totaling 1,580 kilometers of new roadways and expressways had been signed. However, the use of stopgap measures continued because the necessary traffic engineering studies for long-range solutions had not been completed. Additionally, new roads built to ease traffic congestion have themselves often become sources of congestion.

During the past 4 years increasing amounts of money were allocated to the Ministry of Roads and Transport for expansion of the highway system. Overall the total budget for road building and main-

tenance rose from \$357 million in 1974 to \$411 million in 1976. Over one-half of the total budget for road construction during the Fifth Plan was allocated for the completion of projects not completed during the Fourth Development Plan. As of 1976, cost overruns coupled with additional credits needed for completion of Fourth Plan road systems resulted in almost 40% of all new major road projects being postponed until the beginning of the Sixth National Development Plan in March, 1978.

The growth of the vehicle population is expected to continue to outpace the development of the road system. In spite of ambitious plans for expanding rail service and increased volumes of cargo transported by air, the majority of goods will continue to be moved by truck. The growth in the number of trucks is expected to average 24% annually during the 1975-80 period. The average annual growth rate projected for vehicle population as a whole is 17%. Parallel to the growth of the national truck fleet, it is expected that there will be a development of the necessary infrastructure of maintenance terminal and warehousing facilities. The number of passenger cars will more than double between 1975 and 1980 and reach over 1.3 million vehicles.

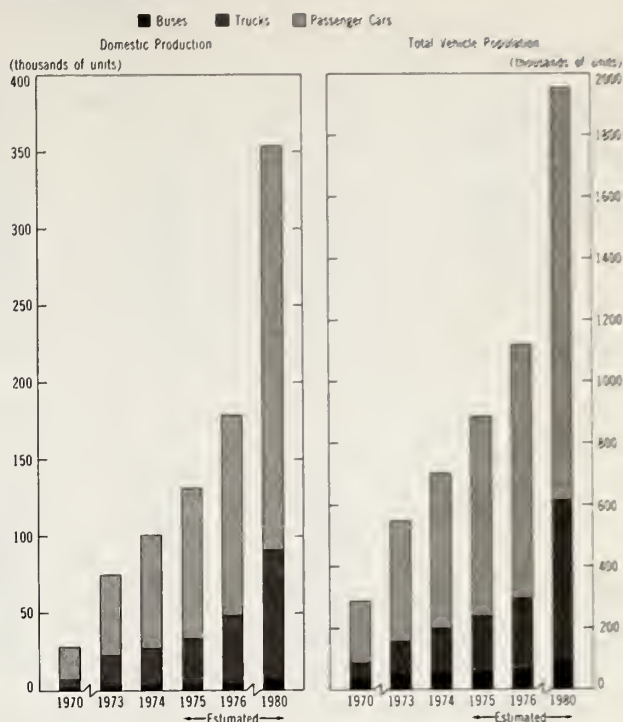
## CAPITAL GOODS MARKET

The total market for road transport equipment, vehicles, and spare parts grew from \$501 million in 1973 to over \$1.2 billion by 1975. Sales are projected to grow at an average annual rate of about 11% per year through 1980 reaching about \$2.1 billion (see table 4). Growth of the truck fleet, improved vehicular maintenance, and planned investments in truck terminals and warehouse facilities are expected to lead to increased sales of both of these categories of equipment.

### Imports

Total imports of vehicles, parts, and other road transport equipment rose from \$405 million in 1973 to over \$1 billion in 1975. An important contribution to this growth was imports of trucks and trailers. They increased by about 374% between 1974 and 1975 as a result of heavy government investments. The largest category of imports in 1975 was automobile parts and components, which totaled over \$476 million and represented 45% of all imports. Specialized vehicles such as garbage trucks, tank trucks, lighting repair trucks, fire engines, and street sweepers, accounted for over \$75 million, or 7% of imports. Total imports of road transport equipment are expected to reach over \$1.4 billion in 1980. As a result of increases in the output of domestic vehicle assemblers, imports are expected to decline as a

Figure 1  
Iran: Vehicle Population



Source: Bank Markazi Iran, estimates based on trade interviews

percentage of total sales from 85% in 1975, to 68% by 1980.

### Domestic Manufacturing

Domestic manufacturing of automotive vehicles is discussed in the chapter on Metallurgical and Metalworking Industries. There are at least 60-65 large manufacturing plants that supply parts and components to the Iranian automotive industry. In addition, there are literally thousands of workshops producing small quantities of parts and components used mainly in the replacement market. Production of parts and accessories for automobiles has grown rapidly in the 1970 to 1975 period. There are three companies, MME Filter Making Company, Novin Company, and Tehran Filter Manufacturing Company which produce air and oil filters: B.F. Goodrich Iran and General Tire and Rubber Company produce tires, and Miral Manufacturing Company, produces automotive windshields and windows.

There were two bicycle producers and two motorcycle assemblers in the country in 1976. In late 1976, Tisro Manufacturing Company was building a plant to produce Honda motorcycles under a Japanese license.

There are a number of companies producing roadway equipment in Iran. The chief supplier of domestically produced equipment is the Vanak Factories Company, owned by the Ministry of Roads



**Table 4.—Iran: Size of the Market for Road Transport Equipment**

(in thousands of U.S. dollars)

	1973	1974	1975	1976 (estimated)	1980
<b>AUTOMOBILES</b>					
Domestic Production .....	17,000	30,600	54,750	81,000	375,000
Imports .....					
United States .....	10,475	15,640	38,620	44,413	29,130
West Germany .....	19,661	83,744	48,989	—	—
United Kingdom .....	46,011	79,994	161,910	—	—
Japan .....	1,138	3,467	6,085	—	—
Others .....	3,924	6,779	20,080	—	—
Total .....	81,209	189,624	275,684	303,250	247,000
Exports .....	107	207	963	1,300	16,500
Market Size .....	98,102	220,017	329,471	382,950	605,500
<b>BUSES</b>					
Domestic Production .....	17,897	21,879	26,268	28,600	55,000
Imports .....					
United States .....	48	81	309	62	230
West Germany .....	0	9	12	—	—
United Kingdom .....	4,214	4,962	4,062	—	—
Others .....	47	26	830	—	1,665
Total .....	4,309	5,078	5,213	4,362	7,700
Exports .....	6,518	14,808	8,356	4,300	7,500
Market Size .....	15,688	12,149	23,125	28,662	55,200
<b>TRUCKS AND TRACTOR TRAILERS</b>					
Domestic Production .....	49,725	71,527	90,032	127,500	170,000
Imports .....					
United States .....	2,419	27,224	153,649	29,630	7,300
West Germany .....	957	3,572	15,653	—	—
Japan .....	734	2,148	8,248	—	—
United Kingdom .....	3,991	5,212	9,856	—	—
Others .....	3,557	4,157	13,127	—	—
Total .....	11,658	42,313	200,533	63,450	18,370
Exports .....	466	1,554	1,431	2,350	18,300
Market Size .....	60,917	112,286	289,134	188,600	170,070
<b>SPECIAL MOTOR VEHICLES</b>					
Domestic Production .....	3,815	4,487	5,281	6,337	11,000
Imports .....					
United States .....	5,823	16,022	24,175	21,700	26,500
Japan .....	1,848	5,281	13,980	—	—
West Germany .....	918	2,354	11,767	—	—
France .....	1,119	2,040	8,986	—	—
United Kingdom .....	15,473	12,763	8,793	—	—
Others .....	3,553	2,305	7,639	—	—
Total .....	28,734	40,765	75,340	82,800	100,700
Exports .....	0	0	0	0	0
Market Size .....	32,549	45,252	80,621	89,137	111,700
<b>VEHICLE PARTS &amp; COMPONENTS</b>					
Domestic Production .....	14,350	16,210	19,300	26,400	89,500
Imports .....					
United States .....	23,914	41,791	72,290	90,000	150,000
United Kingdom .....	88,026	126,705	109,705	—	—
West Germany .....	102,626	149,654	235,304	—	—
Japan .....	7,273	11,905	27,951	—	—
Others .....	54,313	44,635	31,029	—	—
Total .....	276,152	374,690	476,279	600,000	1,050,000
Exports .....	187	2,783	1,890	2,335	4,385
Market Size .....	290,315	388,117	493,689	624,065	1,135,115
<b>ROAD TRANSPORT LIFTING/LOADING EQUIPMENT</b>					
Domestic Production .....	0	0	0	0	0
Imports .....					
United States .....	384	645	730	800	2,500
West Germany .....	624	1,009	3,796	—	—
United Kingdom .....	416	670	2,024	—	—
Japan .....	217	310	430	—	—
Others .....	222	917	1,460	—	—
Total .....	1,863	3,551	8,440	7,500	12,000
Exports .....	0	0	0	0	0
Market Size .....	1,863	3,551	8,440	7,500	12,000

**Table 4.—Iran: Size of the Market for Road Transport Equipment—Continued**

(in thousands of U.S. dollars)

	1973	1974	1975	1976 (estimated)	1980
<b>AUTOMOTIVE REPAIR EQUIPMENT</b>					
Domestic Production .....	185	210	240	265	330
Imports .....					
United States .....	176	454	625	820	1,200
West Germany .....	564	1,052	1,364	—	—
United Kingdom .....	267	281	882	—	—
Japan .....	216	359	491	—	—
Others .....	445	446	1,317	—	—
Total .....	1,668	2,592	4,679	5,757	10,070
Exports .....	—	—	—	—	—
Market Size .....	1,853	2,802	4,919	6,022	10,400
<b>TOTAL MARKET FOR ROAD TRANSPORT EQUIPMENT</b>					
Domestic Production .....	102,972	144,913	195,871	270,102	710,830
Imports .....					
United States .....	43,239	101,857	290,398	187,425	216,860
West Germany .....	125,350	241,394	316,885	—	—
United Kingdom .....	158,398	230,587	297,232	—	—
Japan .....	11,426	23,470	57,185	—	—
Others .....	67,180	61,305	84,468	—	—
Total .....	405,593	658,613	1,046,168	1,067,119	1,445,840
Exports .....	7,278	19,352	12,640	10,285	46,685
Market Size .....	501,287	784,174	1,229,399	1,326,936	2,109,985

Source: United Nations, Organization for Economic Cooperation and Development, supplier country, and official Iranian trade statistics; estimates based on trade interviews.

and Transport. In 1975 this firm employed an estimated 275 people and manufactured over \$5.3 million of roadway equipment such as road signs, road reflector posts, safety cones, guard rails, and similar items. Other suppliers of roadway equipment include Siemens Iran, a joint venture with Siemens AG. of West Germany, which produces directional signaling equipment, and Iran Switch Company which produces safety and warning lights.

## MARKET OPPORTUNITIES

The increase in Iran's road network coupled with a growing vehicle population will create new opportunities for sales of the following categories of products:

**Roadway Equipment.**—The increasing emphasis on the building of 4- to 6-lane expressways will require toll booth equipment, high intensity road lighting systems, and breakaway road signs.

**Vehicles.**—While passenger cars, light trucks, and buses will be supplied increasingly by domestic assemblers and manufacturers, Iranian buyers will continue to look to foreign suppliers of heavy tractors and trailers, and specialized vehicles for a wide variety of uses.

**Vehicle Parts and Components.**—Iran's vehicle population is expected to exceed 2 million in 1981. Demand for spare parts for automobiles, trucks,

and buses will continue to increase rapidly despite projected increases in production of domestically manufactured parts. Growing output by vehicle assemblers will also result in increased sales of components.

**Repair and Maintenance Equipment.**—As a result of the expected growth of investment in vehicle maintenance, especially by commercial fleet operators, all types of diagnostic equipment will be purchased in increased numbers during 1976–80. Equipment for which good sales potential exists includes, body and frame repair systems, engine analyzers, lifts and slings, brake repair equipment, crank shaft and valve grinding equipment, cooling system repair equipment, electrical system test equipment, wheel balancing and alignment equipment, exhaust analyzers, cylinder tools. Equipment specially designed for trucks will have particularly good sales prospects.

**Technology and Services.**—Computerization of transport activities is in the embryonic stage in Iran. It is likely however, that the trend will continue toward application of computer technology to the management of large scale road transport operations. As Iranian truckers become aware of the cost benefits to be achieved from investment in improved management and operating efficiency, there will be opportunities for sales of systems to improve vehicle and load inventory and control, scheduling and routing, as well as for maintenance and spare parts



management. Other opportunities should develop in training of drivers and maintenance technicians, development of operations, maintenance, and warehouse management systems.

## MARKET ENVIRONMENT

### Buyers' Universe

The major market segments of the buyers' universe include: Government agencies such as the Ministry of Roads and Transport and its operating agencies, and the Imperial Iranian Armed Forces: vehicles assemblers, commercial transport firms (bus and truck); large industrial organizations, including the state petroleum and petrochemical companies, as well as other state and privately owned firms, and service centers and garages run by vehicle manufacturers and independent operators.

The Ministry of Roads and Transport, located on Sepahbod Zahedi Avenue in Tehran, purchases vehicles, road maintenance equipment, roadway, and lighting equipment and is responsible for highway construction. Construction equipment for highway projects is generally purchased by contractors. The Ministry makes many of its purchases through selective tenders in Iran. However, major purchases and construction projects are generally handled by competitive tenders. Other users employ a wide range of procurement practices ranging from competitive bidding to direct purchase depending on the size and nature of the organization and the magnitude of the purchase.

### Foreign Suppliers' Universe

The major international manufacturers of motor vehicles are active in Iran, through both domestic

assembly and direct exports (see table 5). Daimler-Benz GmbH (Germany) assembles trucks and buses in Iran and supplies passenger cars by direct export. Bavarian Motor Works GmbH (Germany) relies on export sales through an Iranian sales and distribution networks, as does Ford Motor Co. (U.S.) Chrysler Motor Corp. (U.S.) is in Iran through its U.K. subsidiary, assembling British Hillman passenger cars under the Iranian name Peykan. Only a few of Chryslers' heavy U.S. manufactured vehicles are exported to Iran. General Motors Corporation (U.S.) assembled its German "Opel" cars in Iran for several years as the Chevrolet Iran. It was shifting in 1977 to the domestic assembly of Chevrolets, Buicks, and the Cadillac Seville. General Motors also assembles some GMC trucks. Volvobil AB. of Sweden assembles some trucks but relies on export sales for passenger cars. Japanese manufacturers have been less active in Iran than their European and U.S. competitors. Toyo Kogyo Ltd. produces "Mazda" pick up trucks in Iran, as does Nissan Motors Ltd.; however, export sales of Japanese passenger vehicles are limited in Iran. Among French automobile manufacturers, Peugeot Cie. exports to Iran, while assembly of Citroen cars was ended in 1976 and a new licensing agreement was implemented for the assembly of Renaults. The U.S. truck manufacturers, White Motor Company and International Harvester Corporation have exported vehicles to Iran while another leading U.S. supplier, Mack Truck Inc. assembles trucks in Iran. There are hundreds of foreign firms which regularly supply automotive parts and components to the automotive market in Iran.

Automotive repair equipment in use in Iran includes diagnostic and test units from Sun Equipment Company from the United States, Krypton Ltd. of

*Table 5.—Iran: Foreign Manufacturers of Motor Vehicles with Iranian Licensing and Assembly Operations, 1976*

Firm	Country	Iranian Affiliate	Vehicles Produced
<b>AUTOMOBILES</b>			
Chrysler Ltd. ....	U.K.	Iran National Industrial Manufacturing Co.	"Peykan" (Hillman type 3 model)
American Motors Corp. ....	U.S.	Jeep Iran	"Jeep"
Rover Motors Ltd. ....	U.K.	Morratab Co.	"Land Rovers"
General Motors Corp. ....	U.S.	General Motors Iran	"Chevrolet Iran" (In 1977 plans to shift from production of "Opel" models to "Cadillac Seville", and small "Chevrolet" and "Buick" models from the U.S.)
Regie National des Usines Renault .....	France	Iran Renault Co.	"Renault" Model TL5
<b>TRUCKS</b>			
Toyo Kogyo Ltd. ....	Japan	Mazda Co.	"Mazda" pick-up trucks
Daimler-Benz GmbH .....	Germany	Khavar Co.	"Mercedes-Benz" trucks
Mack Truck Inc. ....	U.S.	Iran Kaveh	"Mack" trucks
Nissan Ltd. ....	Japan	Zamyad Co.	"Nissan" trucks
British Leyland Motors Ltd. ....	U.K.	Leyland Co.	"Leyland" trucks
Volvobil AB. ....	Sweden	Zamyad Co.	"Volvo" trucks
General Motors Corp. ....	U.S.	General Motors Iran	"GMC" trucks
Fiat S.p.A. ....	Italy	Khodrosazan Co.	"Fiat" trucks

Source: Trade interviews.

the United Kingdom, John Bean Co. a division of FMC Corporation) (U.S.), Blackhawk AG. of West Germany (a division of Applied Power Inc. of the United States), Snap-on-tools Corporation of the United States, Weaver Manufacturing and Engineering Company, Ltd. of the United Kingdom and A.E.G., the General Electric Company (U.S.) subsidiary in West Germany.

Impact wrenches and pneumatic repair tools are sold by Atlas-Copco AB. of Sweden and Rockwell International Corporation of the United States. Major hand tool suppliers include Snap-on-tools Corporation of the United States, Heyco AG. of West Germany, Facow Cie. of France, and Moza of East Germany.

### **Marketing Factors**

Vehicle parts and components, as well as repair equipment are handled through a complex system of importers, agents, commission salesmen, and distributors which number in the thousands. Foreign manufacturers generally have exclusive representation agreements with Iranian importers and distributors. There are about 40 leading distributors located in Tehran who are the primary marketing channels for all automotive equipment.

Automotive equipment and parts are normally sold on a keen price competition basis in Iran. Original equipment manufacturers (OEM), parts manufacturers, have an advantage in sales to repair shops but much equipment and components is sold unbranded. The 200-300 major repair shops, however, normally specify OEM parts for repair work.

Iranian manufacturers and assemblers of cars, trucks, and buses also buy components from established OEM suppliers or their licensees. However, they are often required to obtain needed parts from outside suppliers in order to meet production schedules.

Suppliers of roadway equipment generally evolve their marketing strategy around a successful Iranian distributor who has already sold equipment to the Ministry of Roads and Transport and to road building contractors. However, General Electric Company (U.S.), which supplies sodium lamps for roadways in Iran, markets through its Iranian branch office.

Most market promotion of vehicles, spare parts, and repair equipment is through mass media, such as newspaper advertising, with personal calls on distributors and large potential customers. Marketing of trucks, specialized vehicles, and advanced maintenance equipment is more specifically tailored. While there are no national automotive equipment trade shows, the U.S. Regional Trade Center has held several successful commercial exhibits promoting automotive maintenance and repair equipment. The Union of Truck Owners and Freight Agencies Syndicates is a source of information on the trucking industry.

### **COMPETITIVE POSITION OF U.S. SUPPLIERS**

U.S. manufacturers of automobiles, components, and parts are active in Iran. All U.S. automakers either assemble vehicles in Iran through European subsidiaries or export complete vehicles to the market. Most large U.S. OEM parts manufacturers are selling in Iran. Because of the fluctuating nature of the components and spare parts market, in which supply ranges from glut to shortage, U.S. suppliers may find it advisable to take a regional approach to marketing in Iran, establishing a distribution center in one of the Persian Gulf freeports.

Opportunities for sales of heavy duty transport equipment and specialized vehicles will continue to grow for U.S. suppliers. U.S. maintenance and repair equipment have an excellent reputation for advanced design, precision, durability, and reliability. Sales opportunities for U.S. suppliers of this equipment should increase as the level of maintenance improves, particularly among Iranian operators of commercial vehicle fleets, and as more trained mechanics become available. Market promotion should emphasize the cost effectiveness of improved vehicle maintenance, and utilize audio-visual techniques and point-of-sale demonstrations. U.S. suppliers should consider the advisability of developing training programs in vehicle Maintenance which incorporate their equipment as a means of market development.

## **Air Transport**

### **SYSTEM, STRUCTURE, AND SIZE**

In 1976 there were approximately 1,300 Iranian aircraft, of which the Imperial Iranian Armed Forces

accounted for about 80%. As of April 1976, 281 aircraft were carried on Iran Civil Air List (see table 1). Of the civil aircraft 25 were owned by Iran Air, the Iranian National Airlines, and the re-





*Ground servicing at Tehran's Mehrabad Airport. U.S. aircraft predominate in Iran Air's fleet.*

mainder were used in general and supplemental aviation. General and supplemental aviation aircraft included 50 aircraft owned by the Ministry of Agriculture, and 58 private aircraft. With the exception of Iran Air's transport fleet, almost all civil aircraft were single engine propeller-driven planes and helicopters.

There are 36 major and secondary civilian and military airports, (see table 2). Twenty-five of these airports have runways of 5,000 feet or greater length. Most are not equipped with runway lighting, therefore, operations are restricted to daylight hours. Eighteen airports are equipped with radio navigation aids. In early 1977 airports at Abadan, Esfahan, Mashhad, Shiraz, Tabriz, and Tehran, had Instru-

ment Landing Systems (ILS) either in operation or being installed. Iran's air traffic control system makes very limited use of radar and only the Tehran and Shiraz airports are equipped with surveillance radar (see table 3). Iran's air space procedures call for manual procedural separation at all but these two airports. Six Iranian airports (Abadan, Bandar Abbas, Esfahan, Mehrabad (Tehran), Shiraz International and Zahedan International) are included in the Mid-East/Southeast Asia Regional Flight Plan of the International Civil Aviation Organization (ICAO) and either have upgraded, or are in the process of upgrading, facilities, navigational aids, communications, and other equipment to meet ICAO standards.

**Table 1.—Iran: Civil Aircraft Registration and Ownership, 1976**

Owner	Aircraft
Iran Air .....	Boeing 707 (5), Boeing 727 (9), Boeing 737 (4), Boeing 747-SP (2), Fokker F-27 (5).
Air Taxi Company .....	Piper, Douglas DC-3, Aero Commander, Shrike Commander, and Cessna (total 25 aircraft).
Imperial Aero Club .....	Cessna, Piper, Beagle, Cherokee, Bonanza, and Aero Commander (total 55 aircraft).
Pars Air Company .....	Cessna, Aero Commander, Piper, and Islander (total 15 aircraft).
Helicopter Service Company ...	Allouette (25).
IranAir Helicopter Company ..	Jetranger, Agusta Bell, and Allouette (total 28 aircraft).
Ministry of Agriculture .....	Piper, Cessna, Thrush Commander, and Turbo Commander (total 50 aircraft).
Private owners .....	Total 58 aircraft.

Source: Civil Aviation Organization, Civil Air List April 1976.

**Table 2.—Iran: Air Transportation Development**

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>TOTAL CIVIL AIRCRAFT</b>	165	185	201	213	282	400
<b>AIRPORTS</b>						
Category I and II ..	27	32	36	36	38	43
Category III .....	30	36	37	37	39	55
Total Airports ..	57	68	73	73	77	98
<b>IRAN AIR</b>						
Aircraft .....	16	21	22	23	25	35
Employment .....	3,500	4,309	5,606	5,900	6,200	7,500
<b>Passengers</b>						
Domestic (000) ...	521	846	1,100	1,500	1,700	2,000
International (000) ..	210	296	400	600	800	1,000
<b>Total Revenues (Millions)</b> .....	60	103.5	151.4	176	200	250
<b>Capital Expenditure (Millions of U.S.\$)</b> .....	89.2	159.1	318.6	801.8	909.6	1,097

<sup>1</sup> Estimates.

Source: Fifth National Development Plan, Civil Aviation Organization, trade interviews.

Flight operations at Iran's major airports averaged 300-400 per day in 1975, of which slightly less than one-half were civil. Tehran's Mehrabad Airport, the country's largest, handled 56,115 aircraft in 1975, including international and domestic scheduled and nonscheduled flights and local civil aviation. Trends in international and domestic traffic at Mehrabad during 1965-75 are indicated in table 4.

**Scheduled Airlines.**—Iran Air, the national flag carrier, was founded in 1962, taking over limited freight and passenger operations from two private companies. Iran Air carried over 165,000 passengers during its first year of operation. This grew to 2.1 million passengers in 1975, 1.4 million on domestic flights and 600,000 on international routes. Passenger kilometers reached 9.4 million, representing a 17% annual increase over 1974. In 1976, Iran Air's load factor at 57% was up by 12% over

1975. In early 1977 Iran Air served 25 different domestic airports, as well as providing services on international routes to 24 different countries in North America, Europe and East Asia. Iran Air carried nearly 12,000 tons of freight on domestic routes in 1975 (see table 5). Overall revenue from all operations including cargo and passengers was \$201 million in 1975, an increase of \$55 million over 1974 revenues.

In 1976 Iran Air's fleet totaled 25 aircraft. The airline planned to increase its 747 fleet to three 747-SP's and two standard 747 aircraft, and to phase out operation of the F-27's. In early 1977 Iran Air was considering the purchase of additional wide-body aircraft for its international operations. The airline was considering the alternatives of acquiring either additional Boeing aircraft or the European "Airbus."

Iran Air handles most of its own routine maintenance, with the assistance of technical specialists

**Table 3.—Iran: Major Airport Facilities, 1977**

Name	Location	Runway Length (feet)	Surface	Lights <sup>1</sup>	Navigation <sup>2</sup> Aids	ICAO Upgrading Requirements <sup>3</sup>
Abadan .....	Abadan, Khuzistan Province	10,200	Asphalt	BL4,5,6,7,9	NDB, ILS Cat 1	ILSCAT II, Precision Approach Lighting, Runway Center Lighting, Touchdown Zone Lighting, Runway Side Stripe Markings, Fixed Distance Markings, DME, VOR, AFTN-HF RTT (2 channels), UHF RTT (1 channel), AMS-TWR, SMC, APP-LU, FIS-U
Arak .....	Arak, Hamadan Province	5,700	Gravel	None	None	Not included in ICAO Regional Flight Plan
Bandar Abbas .....	Bandar Abbas	12,000	Asphalt	BL4,5,9	TACAN, NDB, Radar	Fixed Distance Markings, VOR AFTN-None, AMS-TWR (1 channel) SMC (1 channel), APP-LU (1 channel)
Birjand .....	Birjand, Khorasan Province	7,300	Asphalt	None	VORTAC, NDB	Not included in ICAO Regional Flight Plan
Bushehr .....	Bandar Bushehr	10,800	Asphalt	BL4,5,9	VORTAC, TACAN, NDB, UHF/DF	Not included in ICAO Regional Flight Plan
Esfahan .....	Esfahan, Esfahan Province	11,500	Asphalt	BL4	VOR, NDB	1 LS CAT 1, Runway Side Stripe Markings, Fixed Distance Markings, Locator, AFTN-None, AMS-TWR (1 channel), APP-LU (1 channel) New Esfahan Airport to have ILS CAT 1, VOR Locator, Precision Approach and all lighting and markings
Kerman.....	Kerman, Kerman Province	9,000	Asphalt	L4,5	TACAN, NDB	Not included in ICAO Regional Flight Plan
Kermanshah .....	Kermanshah, Khuzistan Province	8,800	Asphalt	L4	TACAN, NDB	Not included in ICAO Regional Flight Plan
Mashhad .....	Mashhad, Khorasan Province	12,500	Concrete	L4,5	TACAN, NDB, Radar	Not included in ICAO Regional Flight Plan



**Table 3.—Iran: Major Airport Facilities, 1977—Continued**

Name	Location	Runway Length (feet)	Surface	Lights <sup>1</sup>	Navigation <sup>2</sup> Aids	ICAO Upgrading Requirements <sup>3</sup>
Mehrabad International . . . . .	Tehran, Central Province	13,100	Asphalt	BL2,4,5,6,7,9	VORTAC, NDB, UHF/DF, ILS CAT I Radar-ASR, PAR	Runway side stripe markings, AFTN-LT, HF/UHF RTT, temporarily maintain MAS (New Tehran International Airport to have ILS CAT II, DME, VOR, Locator, Precision Approach and all lighting and markings AFTN-TWR (1 channel), SMC (1 channel), APP-I (1 channel)
Shiraz International . . . . .	Shiraz, Fars Province	14,700	Asphalt	BL4,7,9	VORTAC, VOR, TACAN, NDB, UHF/VHF/DF, Radar-ASR, PAR ILS CAT I	Hull all required Navigation Aids, Lighting and Markings. AFTN=None. AMS-TWR (1 channel). SMC (1 channel), APP-LU (1 channel)
Tabriz . . . . .	Tabriz, East Azerbaijan Province	12,000	Asphalt	L4,5	VORTAC, TACAN, NDB, UHF/DF, Radar	Not included in ICAO Regional Flight Plan
Yazd . . . . .	Yazd	8,500	Asphalt	L4,9	VORTAC, NDB	Not included in ICAO Regional Flight Plan
Zahedan International . . . . .	Zahedan	14,000	Asphalt	L5,9	VORTAC, VOR, NDB, VHF/DF	Visual Approach Slope Indicator System. AFTN-Temporarily maintain MAS (1 channel) AMS-TWR (1 channel), SMC (1 channel), APP/SR-LU (1 channel), APP-LU (1 channel), ACC-LU (7 channels), FIS-LU (GPS)

<sup>1</sup> Lighting: B-rotating beacon, L-lights only (1-portable electric, 2-boundary, 3-runway flood, 4-runway or strip, 5-approach, 6-high intensity runway (HIRL), 7-high intensity approach, 8-sequence flashing, 9-visual approach slope indicators system (VASI), 10-runway end identification (REIL) (threshold strobe), 11-runway centerline, 12-runway end identification (not strobe).

<sup>2</sup> Radio Navigation Aids: DME-distance measuring equipment, ILS-instrument landing system (CAT I, II, III-categories I, II, and III instrument flight rules-IFR), NBR-non-directional beacon, TACAN-(tactical air navigational) UHF Pulse-type Omni range and Distance Measuring Equipment (DME), UHF-Ultra high frequency, VHF-Very high frequency, VOR-VHF Omni directional range, VORTAC-combination VOR and TACAN. Radar: ASR-approach surveillance radar, PAR-precision approach radar.

<sup>3</sup> International Civil Aviation Organization (ICAO) upgrading requirements for airfield lighting, markings, radio navigational aids, AFTN (Aeronautical Fixed Telecommunications Network) and AMS (Aeronautical Mobile Service) are based on ICAO Air Navigation Plan, Middle East and South East Asia Regions, January 1976. Requirements for lighting, marking and navigational aids are of equipment either missing or for which equipment in operation does not meet ICAO standards. Listings for the AFTN and AMS are of all equipment and channels included in the plan, some of which may have been in operation at the time of publication. AFTN: LTT-Landline Teletypewriter (landline cable, VHF, UHF, SHF), RTT-Radio Teletypewriter (HF), MAS-Manual A1 Simplex, RTF-Radiotelephone. AMS: APP-L-Approach control to 10,000 ft., APP-I-approach control to 25,000 ft., APP-LU-approach control to 45,000 ft., APP-PAR-precision approach radar to 4,000 ft., APP-SR-approach surveillance radar, APP-U-approach control service 20,000-45,000 ft., FIS-flight information service, GPS-general purpose communications, SMC-Surface movement control, TWR-aerodrome control service, VOLMET-metrological information.

Source: U.S. Department of Defense Flight Information Publication (Enroute) Supplement Europe, North Africa, and Middle East, May 19, 1977; Air Navigation Plan, Middle East, and Southeast Regions, January 1976, International Civil Aviation Organization.

from Boeing Aircraft Company. Major overhauls are done abroad.

In 1975 Iran Air operated 30 domestic sales offices with a total staff of 1,900 ticket agents. The company installed a computer reservations system in 1976 and plans to expand its utilization to include scheduling, inventory, and maintenance (see Government, Business and Financial Establishments chapter). Iran Air is expanding its business activities into tourism and has equity interest in five Iranian hotels including the Arya Sheraton Hotel in Tehran.

It also owns part of the Iran Hotel Corporations which added almost \$10 million to the airline's operating revenue in 1975.

**Supplemental and General Aviation.**—Pars Air Service Company, founded in 1970, is a charter carrier. In 1976 the firm had 15 aircraft of which 6 were single engine craft from Piper Aircraft Corp. and Cessna Aircraft Co. (both U.S.). It employed 15 pilots and 7 technical personnel. Pars Air is a leading contractor to the Ministry of Post, Telephone

**Table 4.—Iran: International and Domestic Airline Passengers and Freight at Mehrabad Airport**

Year	Outgoing			Incoming		
	Passengers	Freight (Tons)	Mail	Passengers	Freight (Tons)	Mail
<b>International Flights:</b>						
1965	103,499	3,667	188	70,274	4,072	242
1966	152,984	4,040	195	108,066	4,666	333
1967	155,485	3,819	175	114,260	6,124	391
1968	166,576	3,754	195	140,446	7,526	480
1969	180,611	3,555	210	163,832	6,857	675
1970	209,314	3,519	281	193,649	7,107	819
1971	264,410	4,429	303	244,873	7,083	828
1972	292,115	7,248	391	250,347	9,906	871
1973	327,309	7,762	613	300,095	14,018	1,267
1974	412,875	7,546	582	381,677	28,511	1,269
1975	464,764	6,932	564	435,828	20,610	1,694
<b>Domestic Flights:</b>						
1965	94,651	1,010	24	89,943	229	15
1966	115,711	1,074	64	114,094	205	28
1967	138,546	1,252	63	157,120	210	36
1968	156,588	1,607	63	159,212	405	48
1969	175,161	1,835	59	180,999	496	62
1970	217,716	1,821	58	224,079	450	59
1971	231,047	1,821	55	235,825	424	59
1972	271,321	1,981	57	277,212	353	73
1973	352,970	2,242	90	360,660	427	88
1974	423,876	3,142	176	429,399	572	149
1975	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Source: Civil Aviation Organization.

**Table 5.—Iran: Domestic Passenger Traffic and Freight Carried by Iran Air 1975**

Airport	Passengers		Freight (Tons)	
	In	Out	In	Out
Tehran <sup>1</sup>	561,901	568,897	2,892	4,466
Abadan <sup>1</sup>	92,189	92,497	586	518
Esfahan	88,586	94,236	202	73
Ahvaz	35,429	38,858	254	85
Bandar Abbas	41,528	41,240	208	88
Bandar Lengeh	2,136	2,830	8	5
Bushehr	25,392	28,397	272	127
Tabriz	30,976	31,432	127	12
Kharg	15,616	15,291	462	50
Rezaieh	9,950	9,853	25	5
Ramsar	11,130	9,918	0.5	0.3
Rasht	6,822	7,269	7	0.02
Zahedan	20,278	21,641	219	91
Sanandaj	1,336	1,495	0.4	0.4
Shiraz	139,947	136,252	395	367
Kerman	21,536	23,707	76	18
Kermanshah	11,612	11,818	10	3
Mashhad	78,351	79,391	247	76
Hamadan	927	1,014	1	0.01
Yazd	6,800	7,232	7	1
Total	1,204,442	1,223,162	6,001	5,984
NIOC	8,791	15,338	0.05	0.9

<sup>1</sup> Includes Hajj Pilgrims.

Source: Civil Aviation Administration.

and Telegraph for mail transport. Another supplemental carrier is Air Taxi Company, whose 25 aircraft fleet includes Douglas DC-3 transports as well as light aircraft. Air Taxi also performs some Fixed Base Operator functions for other carriers.

Iranair Helicopter Company is a privately owned service company established in 1967. The company has 28 helicopters which are used for passenger service, as well as aerial survey and exploration for mining, petroleum, and natural gas. Another firm, the Helicopter Service Company, is a private passenger carrier which operates primarily as a contractor to the petroleum industry.

The Imperial Aero Club, founded in 1939, trains pilots, maintenance and other aviation personnel. This organization, headquartered at Mehrabad Airport in Tehran, has three branches located in Ahvaz, Shiraz, and Tabriz, as well as a training center in Tehran. The Aero Club operates 55 aircraft in these four locations. In 1975, over 500 pilots received their commercial certificates through this organization.

Iran Air Services Company was formed in mid-1976 as a joint venture company owned 25% by the Ministry of Agriculture, 15% by Iran Air, 10% by Air Taxi Co., 10% by Pars Air Service Company, 10% by Hoorasman Air Company, and the remainder by the Industrial Mining and Development Bank of Iran (IMDBI), Tavanir (a subsidiary of the Ministry of Energy), and the Telecommunications Company of Iran. This company had registered capital of \$1.4 million and operates 39 aircraft, most of which were obtained from the Ministry of Agriculture's fleet.



Iran Air Services Co. provides agricultural services such as spraying, seeding, forest survey, fire fighting, and cloud seeding. In addition, it performs other services such as aerial telecommunication route inspection, auxiliary mail transport and inspection of power lines and oil pipeline facilities. In cooperation with the Red Lion and Sun Society, the company provides emergency medical services in rural areas.

The company operates mainly from regional airports located in Gorgan, Mashhad, Zehedan, Shiraz, Bandar Abbas, Ahvaz, Sanandaj, Rezaieh, Tabriz, Ardabil, Rasht, and Qazvin. The aircraft fleet includes 18 Piper 18A's, 3 Cessna's, 5 Commodores, and 13 other aircraft. In 1976, the company had 32 pilots and 33 technicians. It plans to raise its personnel to 150 by 1978.

## Repair Facilities

There are only a limited number of aircraft service facilities in Iran. Air Taxi Co. calibrates and repairs the two flight inspection aircraft owned by the Civil Aviation Organization (CAO) and does aircraft maintenance for other organizations in addition to maintaining its own 25 aircraft. The Iran-American Aircraft Services Company performs aircraft repairs and maintenance at its facilities, located at Mehrabad Airport in Tehran. The Imperial Aero Club repairs its own aircraft, as well as providing training in aircraft maintenance and repair. The government-owned Iran Aircraft Industry performs maintenance and repairs on military aircraft and also trains aircraft technicians. The Iranian Armed Forces also operate repair depots at major military air bases.

## Principal Government Offices

Iran's civil aviation authority is the Civil Aviation Organization (CAO), which is under the authority of the Ministry of War. CAO is responsible for all civil aviation including aircraft registration, civil air space allocations, landing rights for civil aircraft, and pilot licenses. CAO also operates and maintains all Iranian airfields outside of those directly under military control; it also handles air traffic control at all civil airports. The CAO headquarters is located in Tehran on Shahreza Ave., across from Tehran University.

## TRENDS, PROGRAMS, AND PROJECTS

In Iran's Fifth Development Plan, \$743 million was earmarked for fixed capital investment in air transport; \$378 million of it was to be for navigational aids, air traffic control, and airport construction and expansion as follows:

	(Millions)
Completion of Fourth Plan projects .....	\$ 34
Expansion of existing airports .....	162
Construction of new airports including	
Tehran International Airport .....	76
Construction of small regional airports .....	16
Airport renovation .....	8
Automatic aircraft guidance systems .....	80

An additional \$366 million was to be expended for aircraft.

To accommodate increasing traffic and new aircraft, expansions were planned for existing airports, including runway expansion and reinforcement, new terminals and hangars. Major new airport construction to be initiated during the Fifth Plan period included a new international airport at Tehran, as well as airports at several provincial centers. The Plan also provided for the development of a string of small regional airports designed to facilitate cargo transport, improve mail delivery, and link major population centers with provincial cities and industrial areas.

Plans were also included for purchase and installation of equipment for flight control facilities with the ultimate objective of covering Iran's entire airspace. New aircraft were to be acquired to permit Iran Air to increase both domestic and international flights.

Air traffic in Iran increased by approximately 20% annually during 1970-75. As early as 1966 the anticipation of increased air traffic prompted CAO to take a number of steps to upgrade navigation aids, communications, and air traffic control. In 1967 a \$35-million contract for this purpose was awarded to the Irano-British Aeronautical Consortium (IBAC), made up of firms from Britain, Germany, and France. In 1972, the contract was extended for 5 years to allow IBAC to complete improvements originally scheduled for completion by 1971; by 1976 most of IBAC's work had been completed.

A major portion of the IBAC program included upgrading existing navigational aids and installing new equipment as follows:

	IBAC Changes	Expanded System
VOR* .....	4 additional	
	3 replaced with VORTACS	7
VOR-DME ...	1 new VOR-DME	1
TACAN .....	4 additional	
	5 converted to VORTAC	7
VORTAC ....	7 additional	
	5 TACAN Conversions	15
Total .....		30

\* For explanation of equipment designations see footnote 2 to table 2.

IBAC also installed an additional nine Remote Communications Air-Ground sites (RCAG) for air-ground radio coverage, improved equipment in control towers, as well as provided for increased radar coverage at several major airports.

While the IBAC work greatly improved Iranian navigation, communications, and air traffic control facilities, growing domestic and international air traffic have made it necessary to plan the installation of systems of increased sophistication. In 1974, CAO requested the U.S. Federal Aviation Administration (FAA) to make a "comprehensive" study of the existing air traffic control system and to recommend modernization and improvements to meet the needs of traffic in the following decade. In early 1977 these findings were presented to the CAO. FAA also proposed a project to install the navigational aids, radar, tower facilities, and communications network needed to handle Iran's growing air traffic during the late 1970's and 1980's.

### Specific Projects

The construction of a new international airport for Tehran was given high priority in the Fifth Plan, with construction to be completed in 1981. The U.S. firm Tippits-Abbott-McCarthy-Stratton (TAMS) in partnership with an Iranian firm, was awarded a contract for design of the airport and construction was slated to begin in 1977 with TAMS acting as project manager. The initial phase of the airport includes two terminals and parallel runways of 4,200 meters each, at an estimated cost of about \$800 million. Subsequent phases will include three additional terminal buildings and additional runways. The airport is planned to handle 10 million passengers annually in 1990 and 15 million annually by the turn of the century. A new highway and rail line to the airport located 35 kilometers southwest of Tehran is also planned, as well as a housing complex to accommodate 100,000 persons.

Initial tenders for grading were scheduled to be solicited in mid-1977 with further tenders for paving, terminal buildings and support facilities expected to be called for later during the year. It was expected that bidders would be required to submit fixed price proposals. In early 1977 it was announced that a new public corporation would be formed to manage construction and operation of the new airport. It was subsequently reported that government responsibility for project management had been turned over to the Imperial Iranian Air Force. Completion of the airport has been rescheduled for 1983.

Other projects included in the Fifth Plan include expansion and reinforcement of the runways at the airports of Ramsar, Rasht, Hamadan Nowshahr, Kharg, Rezaieh, Kerman, and Ahvaz; construction of new terminals at the airports in Esfahan, Mash-

had, Shiraz, and Kush; and construction of hangers at Mehrabad. In addition to the new Tehran International Airport, new airport also were slated to be built at Babolsar, Gorgan, and Birjand. Many of these projects will extend into the Sixth Plan period.

If accepted by the Government, the FAA proposal would initiate a major project, the "Iranian National Airspace Modernization Program." The FAA program would (1) convert the existing manual procedural system used for air traffic control (ATC) to a radar based system, (2) expand air-ground communications and radar coverage to support the radar based ATC system, (3) automate the basic ATC functions of flight data collection, processing and distribution and radar tracking and flight identification, which would be integrated with the Air Defense System, and (4) provide improved Instrument Flight Rules (IFR) approach and landing capability at major airports. FAA also proposes a training program for flight controllers as technical personnel is needed for system operation and maintenance.

Key to the automated ATC system would be an Area Control Center near Tehran and 13 terminal area systems equipped for Radar Approach Control/Terminal Radar Approach Control (RAPCON/TRACON). Pilot flight briefing facilities at 40 domestic airports would provide flight information to pilots as well as input flight plans into the automated center. Additional radars would be installed to provide the necessary coverage, and air traffic control and air defense radar would be integrated. All aircraft operating in Iranian airspace would be required to install transponders. Additional VOR, VOR-DME, TACAN and TACAW conversions and new installations would be required to bring the total number up to 49. Additional Remote Communications Air-Ground sites would be installed to bring the total up to 42. Category I ILS systems would be installed at all joint military/civil airports, for a total of 13 new systems. Category II/III ILS Systems would be installed at Tehran, Esfahan, and Babolsar. Other features of the FAA proposal include improved flight inspection, power systems, and tower structures. FAA proposes the program be implemented on a phased schedule over 5 years. Implementation of the program could cost as much as \$250 million.

### GROWTH PROSPECTS

Increasing traffic on Iran's air routes plus a growing number of military sorties flown each day will require a greater coordination of air traffic control. By 1980 the Iranian air fleet is expected to include up to 2,200 aircraft of which about 400 will be civil aircraft. Flight traffic is expected to more than



double between 1975 and 1983. Domestic passenger traffic is projected to reach about two million persons by 1980, while domestic cargo could reach 8,000 tons. Growth of private general aviation is likely to be limited; government policy in general has discouraged the development of general aviation.

One of the biggest obstacles to aviation growth is the inadequate air traffic control system. Iran needs an integrated national air traffic control system that includes both civil and military air operations. Additionally, airports require upgrading for both day and night, as well as all-weather operations. Increased training, not only for pilots, but also for technicians, air traffic controllers, and other personnel, will be vitally needed during 1976-86.

## CAPITAL GOODS MARKET

The Iranian market for civil aircraft and other aviation equipment rose from \$145 million in 1973 to nearly \$450 million in 1975 (see table 6). Sales of civil aircraft were nearly \$200 million in 1975, while sales of aircraft components and parts—including military equipment—also reached \$200 million; civil aircraft engine sales were over \$29 million. Sales of airborne avionics equipment (much of which was purchased installed on aircraft) and of ground avionics equipment, was estimated at \$9 million in 1975. No aviation equipment is manufactured in Iran, and all needs of the Iran's air transport system are imported. By 1980, the total market for civil aircraft and other aviation equipment is projected to exceed \$600 million.

**Table 6.—Iran: Size of the Market for Aviation Equipment**  
(thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>2</sup>
<b>AIRCRAFT</b>					
Domestic Production.	0	0	0	0	15,000
Imports					
United States .....	20,992	89,251	116,849	121,735	146,200
Netherlands .....	8,313	15,874	14,210	—	—
France .....	4,152	2,697	16,123	—	—
Italy .....	22,617	48,560	51,916	—	—
Others .....	0	680	740	—	—
Total .....	56,004	157,062	199,838	209,800	230,000
Market Size .....	56,004	157,062	199,838	209,800	245,000
<b>AIRCRAFT PARTS AND COMPONENTS</b>					
Domestic Production.	0	0	0	0	0
Imports					
United States .....	44,206	67,111	184,776	211,000	256,000
Netherlands .....	803	503	1,765	—	—
Italy .....	6,132	8,350	7,253	—	—
United Kingdom ..	1,136	3,753	4,165	—	—
France .....	181	425	1,413	—	—
Others .....	202	291	683	—	—
Total .....	52,660	80,433	200,055	222,000	280,000
Market Size .....	52,660	80,433	200,055	222,000	280,000

**Table 6.—Iran: Size of the Market for Aviation Equipment—Continued**  
(thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>2</sup>
<b>PISTON AND JET AIRCRAFT ENGINES</b>					
Domestic Production.	0	0	0	0	0
Imports					
United States .....	19,332	5,363	11,898	15,500	20,000
West Germany ...	4,199	5,123	5,415	—	—
United Kingdom ..	2,306	1,689	5,060	—	—
Italy .....	2,556	3,637	3,915	—	—
Others .....	351	199	3,122	—	—
Total .....	28,744	16,011	29,410	36,000	45,000
Market Size .....	28,744	16,011	29,410	36,000	45,000
<b>AIRBORNE AVIONICS EQUIPMENT</b>					
Domestic Production.	0	0	0	0	0
Imports					
United States .....	1,572	1,930	3,125	4,935	3,000
United Kingdom ..	520	399	534	—	—
Netherlands .....	335	511	537	—	—
Others .....	619	711	506	—	—
Total .....	3,046	3,551	4,702	7,800	13,500
Market Size .....	3,046	3,551	4,702	7,800	13,500
<b>GROUND AVIONICS EQUIPMENT</b>					
Domestic Production.	0	0	0	0	0
Imports					
United States .....	470	622	410	550	3,100
United Kingdom ..	2,247	2,347	2,829	—	—
Switzerland .....	48	1,857	101	—	—
Netherlands .....	65	115	312	—	—
Others .....	707	391	578	—	—
Total .....	3,537	5,332	4,230	7,200	13,000
Market Size .....	3,537	5,332	4,230	7,200	13,000
<b>BAGGAGE AND CARGO HANDLING EQUIPMENT</b>					
Domestic Production.	0	0	0	0	0
Imports					
United States .....	330	322	1,640	400	1,200
West Germany ....	423	1,009	2,798	—	—
United Kingdom ...	433	1,241	3,048	—	—
Italy .....	261	563	2,191	—	—
Others .....	216	416	1,763	—	—
Total .....	1,663	3,551	11,440	7,350	9,000
Market Size .....	1,663	3,551	11,440	7,350	9,000
<b>TOTAL MARKET FOR AIR TRANSPORT EQUIPMENT</b>					
Domestic Production	0	0	0	0	15,000
Imports					
United States .....	86,822	164,599	318,698	354,120	429,496
United Kingdom ..	6,892	10,229	16,636	—	—
Netherlands .....	9,516	17,301	17,324	—	—
West Germany ....	5,222	6,732	8,613	—	—
Italy .....	31,566	61,110	65,275	—	—
Others .....	5,638	5,969	23,129	—	—
Total .....	145,656	265,940	449,675	490,150	590,500
Market Size .....	145,656	265,940	449,675	490,150	605,500

<sup>1</sup> Estimates.

Source: United Nations, Organization for Economic Cooperation and Development, supplier country and official Iranian trade statistics; estimates based on trade interviews.

## Imports

U.S. firms were the leading suppliers of civil aircraft and aviation equipment to Iran in 1975, with a market share of about 71%. In 1975 they sold over \$116 million worth of civil aircraft to Iran plus \$192 million worth of civil and military aircraft parts and components. Most of the aircraft operating in Iran are of U.S. origin. The maintenance of this lead by U.S. suppliers through 1980 depends on whether or not Iran Air decides to diversify its all Boeing fleet, and on decisions concerning the future development of the Iranian air traffic control system.

Suppliers from the United Kingdom accounted for sales of \$16 million in 1975. Although this represents only 3.5% of the total market in that year, British suppliers were the market leaders in the sales of baggage and cargo handling equipment as well as ground avionics equipment. This was directly attributable to sales made by International Technical Products Company, the main purchasers for IBAC. Suppliers from the Netherlands accounted for almost 4% of sales of aircraft and related equipment, of which 90% was made up of sales of Fokker aircraft. Along with the sales of this aircraft, the Netherlands sold an additional \$1.7 million in aircraft parts and equipment as well as \$500,000 in airborne avionics equipment. Sales of "Bell Augusta" helicopters by the Italian affiliate of Bell Helicopters Inc. (U.S.), as well as of baggage and cargo handling equipment by other firms, gave Italian suppliers a market share of about 15%. Sales of French-manufactured Alouette helicopters have also increased.

**Domestic Manufacturing.**—There are no domestic manufacturers of aircraft regularly supplying the market for aircraft and parts in Iran. There are, however, two projects underway which will lead to the assembly of both fixed wing aircraft and helicopters by 1980.

Iran Aircraft Industries is a government-owned company which is scheduled to begin to manufacture aircraft parts by 1978. Iran Aircraft Industries will supply some of the spare parts requirements for Iran's military air fleet. It is expected that Iran Aircraft Industries will begin assembling aircraft in the early 1980's. Iran Helicopter Company is a joint venture between Bell Helicopter International Inc. (subsidiary of Textron Inc. of the United States) and the Government of Iran in Esfahan. Iran Helicopter is constructing a \$2 million facility to assemble rotary wing aircraft. About 50 helicopters per year will be assembled beginning in 1978. The Iran American Aircraft Services Company is a joint venture in which the Northrop Aircraft Company (U.S.) holds a 41% share, the Iranian Government 51%, and private Iranian investors the balance. While Iran American Aircraft Services was established primarily

to function as an aircraft maintenance and repair facility, it has undertaken the assembly of some light aircraft on an occasional basis. The first Iranian built Cessna aircraft was assembled in 1974.

## MARKET OPPORTUNITIES

The expansion of aviation in Iran will require the following types of equipment during 1976-80.

**Aircraft.**—Primary purchasers of civil aircraft will be Iran Air and supplemental carriers. Limited market for executive aircraft exists in Iran. However, due to strict government controls on aircraft ownership, the general aviation market will not develop quickly in 1976-80.

**Avionics Equipment.**—Most aircraft in Iran are purchased with avionics installed. If plans to increase the sophistication of the Iranian air traffic control system are implemented, retrofitting improved communications equipment and such components as transponders to Iranian aircraft will be required. The upgrading of the air traffic control system will also result in increased sales of airport control tower equipment, radar, runway lighting systems, en route navigation aids and both ground and ground to air communications equipment.

**Aviation Support Equipment.**—As a result of new airport construction in 1976-85, purchases of baggage and cargo handling systems will increase. Mechanized baggage handling systems, now in operation only in Tehran, will be utilized by other airports. In addition, airport emergency vehicles and other safety equipment will be purchased during 1977-80. Baggage X-ray equipment and personal security equipment are expected to be bought during this time. Additional equipment requirements for new and upgraded airport facilities include passenger paging systems, flight information displays, and other air terminal fixtures. There will be limited requirements for tools, repair equipment, and instrumentation.

## Buyers' Universe

The main purchasers of aircraft are the Iranian Armed Forces organizations, Iran Air, and the supplemental carriers and general aviation firms operating in Iran. Most military purchases from the United States are handled as "Foreign Military Sales" (FMS) cases. Iran Air buys directly from foreign aircraft manufacturers. The other civil aviation organizations purchase aircraft through Iranian agents or directly from aircraft manufacturers. Most aircraft are purchased with avionics equipment installed, and little equipment is retrofitted in the country.



Ground avionics and aviation ground support equipment is purchased by the Imperial Iranian Air Force and the Civil Aviation Authority. The military generally purchase this type of equipment directly from foreign manufacturers, while for the last 10 years CAO has relied on the Irano-British Aeronautical Consortium for technical advice and for purchases of all equipment. This agreement was slated to be completed in 1977, and in early 1977 it appeared that a new agreement might be signed with the Federal Aviation Administration of the United States to manage a subsequent program for upgrading Iran's air traffic control system.

### **Foreign Suppliers' Universe**

Leading suppliers of light aircraft in Iran include Piper Aircraft Company, Cessna Aircraft Company, and Beechcraft Company (all U.S.), and Hawker Siddeley Aviation Ltd. (U.K.). All commercial jetliners used by Iran Air have been supplied by Boeing Aircraft Co. (U.S.), turbo-prop aircraft have been supplied by Fokker N.V. (the Netherlands).

Ground avionics equipment suppliers include the Hallicrafters Company, a subsidiary of Northrop Corporation (U.S.), Collins Radio Company, a division of Rockwell International Corp. (U.S.) which supplies CW and HF equipment, Stancil-Hoffman Corp. (U.S.), which supplies 20-channel recording equipment, and Marconi Instruments, Ltd. (U.K.) which has supplied radar. Other suppliers include Harland-Simons, a division of Simons Engineering, Ltd. (U.K.) who supplies 32-channel recorders, Standard Telephones and Cables, Ltd. (U.K.) who supplies torn tape relay systems, Siemens AG. (West Germany) for major supplies of emergency power supplies and radio-telegraph equipment, Redifoss, Ltd., a division of the British Electric Tractron Co., Ltd. (U.K.), a supplier of radio transmitting equipment.

Baggage handling equipment in the Mehrabad Airport was supplied by Grenville Ltd. (U.K.) while weighing scales were purchased from Schenco (West Germany).

### **Marketing Factors**

Most firms selling aircraft and parts to Iran, either to the military or to commercial airline companies, market through a branch office located in the country. Suppliers of light aircraft generally employ an Iranian sales representative. Firms who sell airport tower equipment and navigational aids generally use an Iranian representative to handle sales; there are 20-25 distributors of aviation equipment in the Iranian market. The use of salesmen for personal contacts is the principal promotional means employed by firms selling sophisticated aircraft and instrumentation in the country.

### **COMPETITIVE POSITION OF U.S. SUPPLIERS**

U.S. suppliers have been extremely successful in the sales of aircraft and spare parts across the whole spectrum of the Iranian air transportation system. However, the presence of a British consortium has placed U.S. suppliers at a considerable disadvantage in sales of navigational aids and aviation support equipment.

A consortium approach to market development by a group of companies with complementary products might provide an effective approach to establishing a presence in the market by U.S. avionics and aviation support equipment firms. The decision of the Iranian Government on the FAA "Iranian National Airspace System" proposal will be a major factor in future sales by U.S. firms.

## **Marine Transport**

### **SYSTEM, STRUCTURE, AND SIZE**

Iran's southern port facilities were originally developed by foreign oil companies. In 1925 they were turned over to the Government. In 1932 the Government established the Ports and Shipping Organization (PSO) to oversee port operations. In 1974 PSO was placed in the Ministry of Roads and Transport and became the agency responsible for the administration of all marine trade affairs, establishment of new ports, and the development of exist-

ing port facilities. It also is responsible for the execution of Iran's marine law and ship registration.

### **Iranian Commercial Ports**

The volume of shipping in Iranian ports was not substantial until the beginning of the 1970's. In 1968 only 500,000 tons of goods were handled by Iran's seven commercial ports. However, as a result of accelerated development after 1973, made possible by increased petroleum revenues, the volume of cargo increased dramatically and port facilities be-

**Table 1.—Iran: Ports and Shipping Development**

	1970	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>CARGO HANDLED (000 tons)</b>						
Bandar Khorramshahr .....	1,698	2,814	3,337	3,906	4,100	8,000
Bandar Shahpur .....	1,011	2,437	3,398	3,812	4,600	9,000
Bandar Abbas .....	359	584	1,460	1,970	2,100	2,500
Bandar Bushehr .....	67	121	421	651	700	1,000
Abadan .....	N.A.	313	635	1,028	1,300	1,500
Bandar Pahlavi .....	337	498	435	410	450	500
Bandar Nowshahr .....	107	169	139	155	150	200
Total .....	3,579	6,936	9,825	11,932	13,400	22,700
<b>COMMERCIAL SHIPS CALLING AT PORTS</b>						
	2,409	2,175	2,550	2,620	2,800	3,600
<b>CAPITAL EXPENDITURES (millions U.S. \$)</b>						
Boats and ships .....	—	47.1	25.3	117.6	135.0	112.0
Port development .....	—	27.5	71.0	92.3	241.4	350.0
Total expenditures .....	—	74.6	96.3	209.9	376.4	470.0

<sup>1</sup> Estimates.

Source: Ministry of Roads and Transport; official Iranian budgets and trade sources.

came overtaxed; by 1975 the volume of cargo handled had reached nearly 12 million tons.

Five of the seven commercial ports are located on the Persian Gulf; the other two on the Caspian Sea are used primarily to handle cargo shipped to and from the U.S.S.R. Through these seven ports passed 11.9 million tons of cargo in 1975. Also 2,620 ships called at them (see tables 1 and 2). Nearly two-thirds of all vessels were small, averaging under 1,500 dead weight tons (DWT).

In addition, to the commercial ports, the state-owned petroleum and petrochemical companies operate specialized ports for crude and refined petroleum products, and petrochemicals.

About 100 navigational aids, including lighthouses, beacons, light vessels, whistles, and lighted and unlighted buoys are at the approaches to Iranian port areas and to mark islands in the Gulf of Oman and Persian Gulf. Since 1975, PSO has operated these navigational aids, which had been operated by an international agency. Few aids exist in the northern ports with only one lighthouse at Bandar Pahlavi. In the south, PSO operates lighthouses at 14 different locations including Bandar Shahpur, Jaz-y-Jabrin, Jaz-ye-Lavan, Bandar Lengeh, Jask, and Cha Bahar. Locations for light vessels and buoys include the approaches to Khor Mussa, Bandar Abbas, Bandar Tombaka, and Kharq Island.

The port of Khorramshahr is located on the Shat-al-Arab, the estuary of the Tigris and Euphrates Rivers, approximately 90 kilometers (54 miles) upstream from the Persian Gulf. The Karun River which joins the Shat-al-Arab at Khorramshahr, is navigable by shallow draft vessels as far as Ahvaz, 308 kilometers (185 miles) upstream, it is Iran's only navigable inland waterway.

The port has nine jetties with a total length of 1,350 meters and a berth depth of 7.3 meters (29 feet) at mean low tide. It has one 50-ton floating crane, but most cargo is discharged using ships' gear.

Ships up to 13,000 DWT can be handled. Khorramshahr also has a shallow draft barge harbor with a small jetty having two track cranes of 100-ton capacity. The barge is used exclusively for the discharge of structural and steel plates.

The port has 13 anchorage spaces located around the harbor for ships not requiring berthing facilities, and over 420 privately owned barges are available for working in the anchorage. In 1975 almost one-third of all cargo shipments were offloaded through this port and 28% of all Iranian nonoil exports were unloaded. The port is connected by road, rail and air with Tehran and other major industrial and population centers.

The port of Bandar Shahpur handled 32% of all incoming cargo and one-fourth of all nonoil exports during 1975. The port is located 65 kilometers (39 miles) inland from the Persian Gulf on the Khor Musa inlet. The port has six berths located on two steel pile jetties with a total length of 1,067 meters. It also has a small cargo handling facility including storage and loading equipment with a ca-

**Table 2.—Iran: Cargo Ships Calling at Iranian Ports by Shipping Agent, 1975**

Shipping Companies	No of Ships	Capacity (000 DWT)
Gulf Agency Co. (Iran) Ltd. ....	364	2,156
Arya National Shipping Lines S.A. ....	340	2,078
Gray, Mackenzie Co. Ltd. ....	196	1,207
S.A. Levant Express Transport Iran ....	158	851
Transmarine S.A. ....	127	885
Seman Pak Co. ....	116	700
Maritime Company Limited ....	115	674
Babco ....	83	497
Saber & Sons Co. ....	74	527
Nahai & Brothers ....	75	352
Haniram Co. ....	74	320
Perse Express S.A. ....	67	357
Mohamadiyan Co. ....	67	249
Hansa Line—Agent in Tehran ....	42	234

Source: Ministry of Roads and Transport



capacity of 2,000 tons per day. Berth depths range from 8.9–10.7 meters (29–35 feet) at mean low tide. The port can accommodate ships up to 25,000 DWT. It handles most of Iran's military imports, bulk grain, and aluminum ore imports.

The port has no dockside cranes, and ships' gear is used for the discharge of all cargo. In 1976 only 25 barges, most owned by a private shipping company, were operating in the port area. The port is connected by rail to the main Tehran-Khorramshahr railroad line.

The port of Bandar Abbas is located in the Straits of Hormoz at the entrance to the Persian Gulf, 1,500 kilometers (900 miles) by road south of Tehran. In 1975, over 16% of all imports were discharged in this harbor. The port has six concrete jetties totaling 1,050 meters and a 10.5-meter (36-foot) berthing depth at mean low tide. The port handles ships up to 15,000 DWT and is the main port for the handling of coal imports and iron ore exports. It has no dockside equipment, and ships are unloaded with their own cranes. The port is a major naval base, as well as headquarters for the Persian Gulf Shipping fleet.

The port of Bandar Bushehr, located 12 kilometers south of Bushehr, has a 5.5-meter deep channel and a 376-meter concrete jetty. These facilities were constructed between 1962 and 1967 at a cost of \$6.6 million. The maximum size of ships which can be accommodated at Bandar Bushehr is 5,500 tons. The port has 16 storage warehouses totaling over 10,000 square meters of area. In 1975, it handled over 650,000 tons of goods. Bandar Bushehr, which is 220 kilometers (132 miles) southeast of Bandar Shahpur, has no rail link to Tehran.

The port of Bandar-e-Pahlavi is located on the Caspian Sea in Gilan Province. It has two concrete jetties which can berth vessels of up to 4,000 tons, and 14 warehouses with a total of just over 56,000 square meters of covered storage area. Bandar-e-Pahlavi is the home port of the Imperial Iranian Navy's Caspian Sea Flotilla (four ships). In 1975, about 3% of all Iranian shipping tonnage was handled by this port.

The port of Nowshahr also in Gilan Province on the Caspian Sea is the smallest of Iran's ports. It handles 1% of all shipping cargo. It has no berthing facilities, and all ships must anchor outside the port area. In addition to handling coastal cargo, the Caspian ports handle shipments between Iran and Europe via the inland waterway system of the U.S.S.R.

The port of Abadan, primarily a petroleum port, has grown in importance for general cargo since 1973, mainly as a result of congestion at Khorramshahr. It is likely that Abadan will continue to serve as an auxiliary port for general cargo through 1980, when port expansion projects will begin to reduce pressures on other port facilities.

**Port Operations.**—PSO is responsible for operations at all commercial ports; however, in 1976 cargo handling at the major ports was turned over by PSO to private firms under contract: Khorramshahr to Iran Terminal Co., Bandar Bushehr to Tehran Khorramshahr Express Co., Bandar Abbas and Bandar Shahpur to Khadamat Co. PSO retained responsibility for port maintenance, navigation, tugs, fire boats, and fixed dockside cranes, but it has made available its freight handling equipment to these companies. The private companies have also made substantial purchases of materials handling equipment. Tehran-Khorramshahr Express Co. has procured exclusively from Dutch sources. Iran Terminal Co. invested about \$7 million in new equipment, \$5 million of which was purchased from U.S. suppliers. All three companies have submitted proposals to PSO to expand their cargo handling responsibilities when several port expansion projects are completed; however, as of early 1977 no decisions had been made on the proposals.

**Oil Ports.**—Iran has several specialized ports operated by the National Iranian Oil Company (NIOC) and its associated companies, the largest of which is located at Kharg Island in the Persian Gulf. Other oil ports are located at Bandar Mahshahr, Abadan, Lavan, and Imam Hassan. Over 147 million tons of refined and crude petroleum were loaded in Iran during 1974 (the latest year for which data was available), and 3,348 oil tankers called at Iran's ports.

Kharg Island is the chief crude oil export terminal. Oil produced at all the major inland fields flows through land and submarine pipelines to the Kharg Marine Export Terminal. On the eastern side of the island, the largest export jetty in the industry provides 10 berths for supertankers. On the western side, a sea island provides additional berths for mammoth tankers of the 500,000 DWT class. The completion of a new offshore loading facility, called the Second Kharg Sea Island, in 1976 doubled the terminal's crude oil loading facilities.

In 1969, the first of a series of oil storage tanks were completed, each series will have a capacity of over 1 million barrels of crude. Since then, the island's major tank farm has grown in increments of millions of barrels of storage capacity. In 1976 crude oil storage capacity at Kharg Island for inland oil fields production exceeded 20 million barrels.

While Kharg terminal is the export outlet for the production of Iran's major inland oil fields, at various points on the mainland shore, at other islands, and on the sea itself, export terminals are available for Iran's offshore production.

The Iran Pan American Oil Company (IPAC) facilities include crude oil production units and storage on Kharg Island. Storage capacity is 1.5 million

barrels for Darius crude, 2 million barrels for Fereidoon crude, and another 2 million barrels of storage capacity for Ardeshir crude. In addition, the 1-million barrels crude oil storage barge, "Pazargad," is anchored at the Cyrus oil field. The barge includes desalting facilities to prepare the crude for market requirements, along with living quarters for workers.

At Lavan Island, a Marine Export Terminal is shared by Lavan Petroleum Company (LAPCO) and Iran Marine International Oil Company (IMINOCO). The jetty handles supertankers which receive their crude via the 3 million barrel LAPCO tank farm and the 1.5 million barrel IMINOCO tank farm.

Along the Persian Gulf coast, at Bahregansar, Societe Irano-Italienne des Petroles (SIRIP) operates an oil center with production facilities and storage capacity of 2 million barrels of crude. The jetty is capable of handling only small tankers, but a mooring buoy is at sea for the loading of supertankers.

Major export facilities for refined products are located at Bandar Mahshahr Terminal on the Khor Musa inlet of the Persian Gulf. One of the six jetties at the Bandar Mahshahr Terminal is used for LPG exports. The major petrochemical export facility is located nearby at Shahpur Chemical Company Export Terminal, also on the Khor Musa inlet of the Persian Gulf. Refined products facilities are also operated at the Abadan refinery.

## Shipping Lines

Although the majority of Iran's foreign trade was by sea, and the Persian Gulf is an important international waterway, the country had almost no merchant marine until 1968 when the government-owned shipping lines Arya National Shipping Line was formed as Iran's national flag carrier. In 1976 it had 36 ships and employed 920 people. The average age of its fleet in 1976 was 6 years, and average ship weight was 12,600 DWT. Plans are for the national line to develop a fleet of 60 merchant ships by the mid-1980's. In 1975 eight new vessels averaging 16,000 DWT were purchased from West Germany. The company also charters 60 ships annually for special voyages.

In 1975 Arya National handled 20% of Iran's imports by weight and 95% of Iran's nonoil exports shipped from Iranian ports. In 1976, the company's ships plied sea routes ranging from Japan and the United Kingdom to the east coast of the United States. In addition, it operated a hydrofoil service between Khorramshahr and Kuwait.

Arya National also has an equity position in the Irano-Hind Shipping Lines (a joint venture with a private Indian firm) which was created essentially to transport iron ore from India to Iran. In 1977,

the company was working with the Government of Egypt to establish a joint shipping company with that country. Arya National Shipping Lines also is a member of the Ekman Conference which handles shipping affairs on the Persian Gulf and North European routes; the RCD conference which covers shipping lines and routes between the Persian Gulf and ports located on the east coast of the United States, and the ports of the Mediterranean Sea in Europe; and the Japanese Conference which sets out routes and tariff rates between the Persian Gulf and Japan.

The National Iranian Tanker Company was founded in 1975 as a subsidiary company of the National Iranian Oil Company (NIOC). The tanker fleet initially consisted of eight tankers with a total of 315,000 DWT. In early 1976, the company purchased three additional very large crude carriers and two refined products carriers for \$60.5 million from the British Petroleum Company (BP) of the United Kingdom. Total tonnage of the five ships is 1.3 million DWT, bringing the company's total to 1.6 million DWT at the end of 1976. In addition to the five ships sold, BP will lease five matching vessels to Iran on charter for oil transportation operations. In 1976, the National Petrochemical Company (NPC) purchased its first liquid petrochemical tanker ship from the Iran-Ocean Company (France). This is a 50-50 joint venture owned by NPC and Gas-Ocean Cie (France). The ship has a capacity of 43,750 DWT, can transport products such as propane, butane, and ammonia in  $-460^{\circ}\text{C}$  conditions, and costs over \$50 million. NPC plans to build nine other similar ships by 1984.

In addition to the large state-owned lines, there are a number of smaller private shipping companies and ship owners who operate in coastal waters or are engaged in trade with Persian Gulf countries. The Iran Express Line operates a number of ships in the 10,000-15,000 DWT range. A syndicate was formed by the larger companies in 1970. The Syndicate of Shipowners and Representatives (Arya Building, Karim Khanzand Avenue, Fisherabad Crossing, Tehran) represents both ship owners and operators as well as shipping agents of domestic and foreign firms.

## Ship Building and Repair Facilities

The Shenavch Ship Building Company located near Abadan has berths for building ships ranging from 350 DWT to over 4,000 DWT and employs about 400 people. Shenavch builds six barges per year and approximately 18 fiberglass fishing boats of 35-foot length (see table 3). A large repair station and a parts reclamation shop has been equipped by Sueremo AB. (Sweden).

The facility includes two repair docks, a dry dock with a maximum capacity of 2,000 DWT, and a



**Table 3.—Iran: Ship Building Companies, 1976**

Name of Firm	Location	Production, 1975
Shenaveh Co. ....	Khorramshahr	6 barges, 18–35' fishing boats
Iran Marine Industrial Co. ....	Bushehr	7 barges
Arvandan Co. ....	Abadan	Pilot boats for Navy
Arya Co. ....	Nowshahr	15–8-16' fiberglass boats
Marine Tools Mfg. Co. ....	Motelgho	100–14' recreational boats 30–19' recreational boats
Sea Boat Co. ....	Mazandaran	500–outboard boats
20–30 Workshops ....	Various Locations	40–50 barges

Source: Trade interviews.

floating dock for ships up to 600 DWT. Repairs on larger ships can be made alongside a quay wall having crane facilities of 15 and 30 tons.

Iran Marine Industrial Company, located in Bandar Busher, has built an average of seven barges per year since the early 1960's. The firm also handles ship repairs. In Abadan, the Arvandan Company, a private Iranian firm, has built aluminum and fiberglass pilot boats for the Imperial Iranian Gendarmerie and Navy since 1975. The firm also repairs small craft for the Navy. There are also three other firms that produce fiberglass boats in Iran with a total output in 1975 of over 300 boats.

The Ports and Shipping Organization (PSO) has operated a repair station in Bandar Shahpur since 1968 to repair its boats and those of the Southern Fisheries Organization. Technical assistance for the design of the project was undertaken by Wagner Biro AG. (Austria). The facility employs 50 skilled and semiskilled workers. In 1976, the repair station had an equipment budget of \$730,000, which was used for the purchase of spare parts. Although the facility has a complete workshop for the fabrication of replacements, original manufacturers' spare parts are preferred, and an extensive inventory of parts is maintained for this reason.

Another repair facility in Khorramshahr, Khorramshahr Marine Services Company is a private firm specializing in the repair of electrical equipment and ships' radar. This firm operates the only equipment repair facility for such equipment in Iran's southern ports, and serves as a distributor for nearly 15 major foreign electronics companies for shipboard electronic instruments. In 1976, Khorramshahr Marine Services employed one graduate engineer, five technicians brought from India and Jordan, and eight Iranian trainees.

## TRENDS, PROGRAMS, AND PROJECTS

In 1970 Iran's port facilities had no difficulty in handling the 500,000 tons of cargo which passed

through them. By 1976 a twelvefold increase in cargo from 1970 levels caused serious problems in Iran's port areas. In 1970, the average waiting time for ships calling at Iranian ports was 122 hours. By 1975, facilities were strained to the limit, despite 24-hour-a-day operation, and the average waiting time for ships had been stretched to over 400 hours. This problem has resulted in the fixing of surcharges by shipping conferences as high as 60% of freight charges, accumulation of demurrage fees of over \$2 billion, as well as a high incidence of cargo damage caused by long exposure of goods to the elements.

Iran's Fifth National Development Plan (1973/74–1977/78) envisions a major upgrading of port facilities to increase port capacity from 7 million tons to 29 million tons during the Plan period. Ores and grain were expected to account for 50% of this total. Port management was to be placed on a commercial basis and the authority of PSO was to be strengthened, while private sector firms were to be contracted for provision of port services including stevedoring, transport, and other cargo handling activities. The construction of berths, warehouses and other facilities by shipping and transport firms, and trade associations was to be encouraged. Port communications facilities were to be upgraded. Training for PSO personnel was to be improved and a training center established.

Port construction and expansion projects totaling \$1.2 billion were to be initiated or completed during the Fifth Plan period. Fixed investment for marine transport was set at \$2.8 billion, of which \$918 million was for port construction and development, and the remaining \$1.9 billion was earmarked for shipping, of which \$1.3 billion was to come from private sector sources. The Plan called for the completion of new berth construction at Bandar Shahpur and jetty repairs at Khorramshahr begun under the Fourth Plan. New projects included in the Plan are: construction of new berths, grain silos, ore handling facilities and barges at Bandar Shahpur; expansion of Bandar Busher; new port facilities at Bandar Abbas, including grain storage and ore handling facilities; expansion of facilities at Bandar Pahlavi and Bandar Nowshahr, construction of a new commercial port at Chahbahar in the southeast; and building of several new small fishing ports. Of the total allocations for port development, about \$215 million was earmarked for purchase of navigational aids and cargo handling equipment.

Investment in shipping was planned to increase the national fleet from 18 to 90 vessels during the Fifth Plan period, with a commensurate increase in cargo capacity from 1.2 million to 8 million tons. Purchase of small ships and barges to facilitate cargo unloading in ports also was planned.

## Projects

Expansion of Iran's port facilities was given high priority in the Fifth Plan, but the unprecedented port congestion of 1974/75 gave increased importance to the port construction and expansion program. The key projects are described below.

A new harbor will be built 10 kilometers from Bandar Abbas to augment the existing port which is planned to become primarily a naval facility. Slated to be completed in the mid-1980's, the construction and equipping of this new harbor will cost over \$1 billion. In 1975 Condotti Aqua Italia, a consortium of 14 Italian firms, won the turnkey contract for the design and construction of the new port. The construction management was assigned to Nederlands Dok-en Scheepsbouw Mij u.o.f. (Nedco), a Dutch contractor. The port will consist of 10 general cargo berths, 4 container berths, 1 agricultural terminal, 2 bulk cargo berths, 1 passenger terminal berth, 1 Lighter Aboard Ship (LASH) vessel barge terminal, 1 fishing port. It also will have several nonferrous ore handling berths, special cargo berths, bunkering facilities, a "Roll-on/Roll-off" (ro/ro) berth for handling vehicles and mobile equipment, service craft facilities, a bonded free port area, as well as, workshops, warehouses and utilities, feeder roads, and a new town for port personnel. In late 1976 dredging was underway and a breakwater was near-

ing completion. Another key project in the development of Bandar Abbas is the construction of a railroad line linking Bandar Abbas to the national system via Kerman.

A four-berth expansion is planned for Bandar Busher, and a three-berth expansion and breakwater for Chabahar. The feasibility studies, master plans, Phase I design and soil testing were undertaken by Adibi Harris Associates, a joint venture of Fredrick Harris Co. (U.S.), PSO and Dames and Moore International, subsidiary of the U.S. firm. Invitations to bid on Phase II design for both ports were expected to be issued to local engineering firms in early 1977, while international construction tenders will probably be solicited in 1978.

A contract for a major port expansion project in Khorramshahr was awarded in 1975. The project, which included construction of four berths and the rebuilding of the barge harbor by Chinjin Co., (South Korea) was completed in early 1977, except for deep water dredging. Also, Iran Kampsax Co. designed 23 9,000-square meter warehouses and 1 20,000-square meter container freight station to be built in Khorramshahr. Projects for the construction of two new berths and a cold storage warehouse project at nearby Abadan have been delayed and will probably be included in the Sixth Plan.

Bandar Shahpur, which had six berths in 1976, was undergoing a 28-berth expansion in three phases



*Major expansion at port of Khorramshahr is to be completed in 1977.*



and will become Iran's largest port. By mid-1977, at least a year behind schedule, the initial four-berth expansion undertaken by an Iranian consortium was slated to be commissioned. The French firm Doumetre Travaillaux Cie. was awarded a contract in 1975 for construction of the next 10 berths, including 4 container berths, and work should be finished in 1978. The final 14 berths, awarded to a German-Dutch-Iranian group headed by Edmond Zoubin in 1975, are scheduled for commission in early 1979, but it seems doubtful that this schedule will be met.

The Bandar Shahpur iron-ore handling facility is called a "temporary" facility by PSO because a large iron-ore handling port will eventually be built at a nearby site. Although not quite completed in 1976, it was already in use. A Japanese-Australian consortium headed by Toa Harbor Works Ltd. received the construction contract in 1974, and cranes and other cargo handling equipment were supplied by Thyssen AG. (West Germany). The barge harbor project, awarded in 1973 to Contronizmix (Romania), is expected to be operational in early 1978. Tenders for the construction of roads and utilities totaling \$100 million were solicited in 1976. A new highway and railroad connecting the port with major Iranian cities was under design in 1976, but will not be completed until after the port expansion is finished.

A second port complex at Bandar Shahpur, a few miles from the present port site, has been planned by PSO. This facility will house the permanent iron-ore port, an explosives handling area, and a large container terminal. Annual capacity of the new complex will be 5 million tons. It is doubtful that this project will begin before 1978.

In a move toward improving the country's shipbuilding and repair capabilities, the Government has committed \$8.1 million to the building of a new shipyard in the southern port of the country. The Persian Gulf Shipbuilding Company will become the first major shipbuilding and repair yard in Iran. This facility is to be located at Gachin, 27 kilometers west of Bandar Abbas, on 1.2 million square meters of land. It will employ 3,700 people, have the capacity to repair 100 ships of 200,000 DWT and produce six vessels of 20,000 DWT annually. The repair facilities will consist of two drydocks capable of handling 250,000 DWT and 500,000 DWT vessels, one floating dock for vessels of 40,000 DWT, and include a construction lift capable of launching and retrieving vessels of 20,000 DWT. Workshops to be built in conjunction with the project include a fabrication shop, machine shop, pipe shop, electrical shop, and a maintenance area. The building of the facilities is planned to be undertaken by the Hydanui Company (South Korea) for \$8.1 million. The facility is slated to become operational in 1979.

## GROWTH PROSPECTS

Iran's Fifth National Development Plan (1973/74-1977/78) allocated over \$900 million for port expansion projects. During the first 4 years of the Fifth Plan period, the Government actually budgeted over \$432 million on various port facilities expansion projects, as by the end of the Plan period, over \$700-800 million will have been spent. Commitments to port expansion projects should keep annual expenditures at a high level until 1980. During the Fourth Plan period, the Government allocated only \$78 million on port projects.

Iran's increase in development projects and the massive rise in imports during 1974-76 has necessitated a complete rebuilding and expansion of Iran's port facilities. By early 1976, the Government had initiated a large program for expansion of ports and had begun to plan long-term solutions. Other remedies for the chronic congestion of ports include a doubling of available warehouse space and, in 1975, importation by the Ports and Shipping Organization of 2,000 new tractor-trailer trucks to move goods out of congested port areas. The total increase in Iran's port capacity after all projects have been completed will be in the neighborhood of 30 million tons per year. Cargo handled by Iranian ports is projected to reach about 23 million tons by 1980.

However, to be fully effective, physical improvements will have to be coupled with better management, increased maintenance, and the streamlining of time-consuming customs clearance procedures. Port improvements will have to be made in conjunction with improvements in other transportation infrastructure including completion of new road and rail links.

## CAPITAL GOODS MARKET

In 1975, Iran's total market for vessels and marine equipment reached over \$125 million (see table 4). Vessel imports, which represent nearly 95% of the total market for all marine equipment, have fluctuated. Large deliveries of vessels to the Arya National Shipping Lines in 1975 from Poland and West Germany resulted in total sales over four times the 1974 level. Expected purchases by the National Iranian Oil Company, the National Petrochemical Company and the Arya National Shipping Lines should result in steady market growth through 1980. Local manufacturing of barges and other vessels will increase slightly, but despite completion of the new shipyard near Bandar Abbas, domestic industry is expected to supply only 3% of the market by 1980.

Port construction and expansion projects underway and planned will result in increased purchases

**Table 4.—Iran: Size of the Market for Marine Transport Equipment**

(thousands of U.S. dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>MARINE SIGNALING AND CONTROL EQUIPMENT</b>					
Domestic Production ..	17	50	120	150	200
Imports					
United States .....	391	417	230	125	250
West Germany .....	62	108	106	—	—
Denmark .....	118	161	130	—	—
Japan .....	210	348	433	—	—
Others .....	22	57	389	—	—
Total .....	803	1,091	1,288	1,600	2,200
Exports .....	0	0	0	0	0
Market Size .....	820	1,141	1,408	1,750	2,400
<b>SHIPS AND PARTS</b>					
Domestic Production ..	850	970	1,250	2,040	4,700
Imports					
United States .....	393	498	5,257	6,500	8,200
Japan .....	3,128	5,880	69,436	—	—
West Germany .....	17,945	15,723	1,740	—	—
United Kingdom .....	286	235	12,313	—	—
Others .....	25,340	2,957	28,818	—	—
Total .....	47,092	25,293	117,564	135,000	112,000
Exports .....	—	—	30	70	250
Market Size .....	47,942	26,263	118,784	136,970	116,450
<b>MARINE LIFTING AND LOADING EQUIPMENT</b>					
Domestic Production ..	—	—	—	—	—
Imports					
United States .....	152	258	1,456	750	2,500
Japan .....	55	127	748	—	—
West Germany .....	332	603	1,318	—	—
United Kingdom .....	86	212	409	—	—
Others .....	40	220	1,645	—	—
Total .....	665	1,420	5,576	16,000	39,000
Exports .....	—	—	—	—	—
Market Size .....	665	1,420	5,576	16,000	39,000
<b>TOTAL MARKET FOR MARINE TRANSPORT EQUIPMENT</b>					
Domestic Production ..	867	1,020	1,370	2,190	4,900
Imports					
United States .....	936	1,173	6,943	7,375	10,950
Japan .....	3,393	6,355	70,617	—	—
West Germany .....	18,339	16,434	3,164	—	—
United Kingdom .....	378	463	12,834	—	—
Others .....	25,514	3,379	30,870	—	—
Total .....	48,560	27,804	124,428	152,600	153,200
Exports .....	—	—	30	70	250
Market Size .....	49,427	28,824	125,768	154,720	157,850

<sup>1</sup> Estimates.

Source: United Nations, Organization for Economic Cooperation and Development, supplier country and official Iranian trade statistics; estimates based on trade interviews.

of marine signaling and control equipment, and lifting and loading equipment for cargo handling, including both shipboard and shore types. Sales of such equipment are projected to grow from \$6.9 million in 1975 to over \$41 million by 1980.

## Imports

Imports of ships and parts grew from \$47 million in 1973 to over \$117 million in 1975, and they are

**Table 5.—Iran: Imports of Vessels (including spares) by Type**

(thousands of U.S. dollars)

Category	1973	1974	1975	1976
Ships and Boats (including military) .....	29,737	6,608	33,507	26,250
Cargo Vessels .....	15,400	2,600	66,682	<sup>1</sup> 93,000
Tugboats .....	219	13,319	7,418	4,300
Fishing Boats .....	600	800	1,772	2,200
Fire Boats/Dredgers .....	727	406	3,972	4,800
Supply Vessels/Survey .....	273	1,390	3,885	4,200
Pleasure Boats .....	136	170	328	250
Total .....	47,092	25,293	117,564	135,000

<sup>1</sup> Includes three supertankers and two liquid-products carriers bought from British Petroleum Corp. for \$60.1 million by The National Iranian Tanker Company.

Source: Ports and Shipping Organization, official Iranian import statistics, and supplier country export statistics.

expected to be \$112 million in 1980 (see table 5). In 1975 Japanese suppliers furnished almost 60% of the value of ships brought into the country. The majority of this amount resulted from the delivery of 15 tug boats ordered by the Ports and Shipping Organization (PSO). In 1975, Poland sold an estimated \$26 million of cargo vessels to the Arya National Shipping Lines. U.S. suppliers sold a few vessels to Iran in 1973/74, and a number of specialized vessels during 1975. These vessels consisted of three cargo vessels, six fishing boats, two fire boats, and seven survey vessels delivered to the National Iranian Oil Company. U.S. firms also sold marine diesel engines in Iran. In 1975 the market share of U.S. firms stood at 4%. In 1973/74 West German firms supplied a number of vessels to PSO, including dredges, floating cranes, and fire boats.

Imports of navigational and marine lifting and loading equipment grew from \$1.4 million in 1974 to over \$5.5 million in 1975. U.S. suppliers furnished about \$1.5 million of all imported equipment in these categories, including winches, fork lifts, and other cargo handling equipment. West German suppliers sold an estimated \$1.3 million in value of these categories of equipment in 1975, representing about 20% of the market. German exports consisted mainly of ship engines, winches, and harbor equipment, such as cranes. U.K. suppliers sold an estimated \$500,000 worth of equipment in 1975 mainly composed of ship radar equipment as well as winches. Japanese suppliers sold over \$1.1 million in 1975, raising their exports three times over the 1973 total. The main types of equipment imported from Japanese suppliers were winches and shipboard equipment for cargo offloading. In 1976, Hitachi Ltd. won an order from PSO to provide cranes worth \$5 million.

## Domestic Manufacturing

In 1975, \$1.3 million in value of small vessels were built by Iranian shipbuilders. The Shenaveh



Ship Building Co. fabricates market buoys and other navigational aids. There is no domestic production of ship's radar, winches, engines, or cranes for use in ports.

## MARKET OPPORTUNITIES

The Iranian plans for the expansion of port facilities will require a substantial amount of equipment in 1976-80. Additionally, numerous vessels for use in Iranian harbors and coastal waters will be purchased, as well as oceangoing cargo vessels and tankers.

**Ships and Cargo Vessels.**—The rapid expansion of Iran's port facilities and the growing tonnage of imports each year have resulted in increased purchases of specialized harbor vessels such as tugboats, fire boats, dredges, and other types of ships. Substantial additional purchases are expected to be made by the Ports and Shipping Organization during 1976-86. Major Iranian shipping companies will purchase large cargo ships and specialized tanker vessels from abroad, while smaller shipping firms, the petroleum industry, and other specialized users will require cargo carriers and supply and service vessels of lesser tonnage.

**Ship Equipment and Parts.**—Only a limited demand is expected for equipment such as propellers, outboard motors, marine diesel engines, and anchors. Iranian repair facilities almost invariably use original manufacturers' parts rather than substitute parts from other manufacturers or fabricate their own. This trend is expected to continue.

**Marine Signaling Equipment.**—During 1976-86, the market will develop for shipboard navigational equipment as well as channel-marking equipment and other aids for use in the new harbors being built. Echo sounders for fishing boats will also be sold; as well as some communications equipment such as ship-to-shore radios.

**Harbor Equipment.**—The expansion of Iran's existing port facilities will require increasing use of floating and track cranes for offloading vessels. During 1976-80, an estimated 50 of these cranes (6-50 tons) are expected to be purchased from abroad. Specialized equipment such as ore, container and grain handling equipment, forklift trucks, and other ship-side equipment are expected to be purchased during 1976-86.

### Buyers' Universe

Iranian purchasers of marine transport equipment are limited in number. The purchasing agency of the Ports and Shipping Organization (PSO) is lo-

cated on 262 Shahreza Avenue in Tehran. PSO is the major buyer of tugboats, pilot boats, dredges, and other harbor craft. It also buys cargo handling equipment, navigational aids, and marine communications equipment. The Southern Fisheries Corporation and the Northern Fisheries Corporation are the main purchasers of fishing boats in the country (see chapter on Food Processing and Packaging). Cargo vessels are purchased by Arya National Shipping Lines located at 127 Shah Abbas Avenue, Tehran. There are a few other shipping lines which purchase small numbers of oceangoing and coastal vessels and other marine equipment.

Tankers are purchased by the NIOC shipping subsidiary National Iranian Tanker Company and the National Petrochemical Corporation, which also purchase limited amounts of cargo handling and other marine equipment for the specialized ports they operate. NIOC and its affiliates and contractors engaged in offshore exploration and drilling also purchase supply and service vessels (see chapter on Mining, Petroleum and Natural Gas Extraction). The Imperial Iranian Navy also buys some nonmilitary ships and boats. Stevedoring and warehousing companies under contract to PSO are major purchasers of cargo and materials handling equipment.

Most equipment purchases by government organizations, such as Arya National Shipping Lines and PSO are made through international tenders. Arya National Shipping solicits tenders for vessel construction from various shipping yards and has ships from eight different countries in its 36-vessel fleet. NIOC prefers to buy used vessels rather than have them built to avoid the capital expenditure and long waiting time for delivery of new tanker ships. NIOC relies on Lloyd's Shipping Company Ltd. in London for assistance in negotiating purchase of vessels.

The supply of equipment for port development projects will in most cases be determined by the contracting firms rather than PSO. For example, in the building of the new harbor at Bandar Abbas, the Italian consortium Condotti Aqua d'Italia, consisted not only of civil construction firms, but equipment suppliers as well. Some cargo handling equipment may be purchased by the firms which have contracts with PSO for port operations.

### Foreign Suppliers' Universe

Few firms supply to the marine transportation industry. Shipyards in West Germany, Denmark, and Japan supply most of the cargo and port vessels.

Parts for marine equipment are sold by several foreign suppliers. For example, diesel engines are sold by General Motors Corporation (U.S.) Deutz AG (West Germany), Caterpillar Tractor Co.

(U.S.) and Volvo AB (Sweden). Outboard engines for small craft are sold by Johnson Outboard Motors, Evinrude Motors, a division of Outboard Marine Corp., and Mercury Marine Corp., a division of Brunswick Corporation (all U.S.), and Yamana, Ltd. and Yanmar Diesel Engine Co. Ltd. (Japan). Ships' radar equipment is supplied by Marconi Instruments Ltd. and Kelvin Ltd., both (U.K.), and Japan Radio Co. Ltd. (Japan), among others. Cargo cranes and other cargo handling equipment is supplied by Demag GmbH (West Germany) and Hitachi Ltd. (Japan). Forklifts are supplied by Eaton Corporation, Industrial Truck Division—(Yale) (U.S.) and the Toyota Motor Co. Ltd. (Japan).

### Marketing Factors

Firms supplying equipment and services to PSO and other marine equipment users generally establish representation in Iran and maintain contact with PSO and other buyers to keep informed of sales opportunities on a timely basis. Many foreign firms which have been successful in winning engineering

and construction contracts have affiliated themselves with Iranian companies. Ship equipment and spares are usually sold by agents with offices located in the southern ports. Suppliers must make exclusive agency contracts with an importer/distributor to be successful in this market. Pricing, delivery, and availability of spare parts are key factors in the sales of port equipment and vessels.

### COMPETITIVE POSITION OF U.S. SUPPLIERS

U.S. suppliers have only a small share of the total market for marine transport equipment and services in Iran. One of the main reasons for this is that relatively few U.S. companies have established effective sales and service representation in the country. Effective local representation is important in the marine transportation industry, since maintaining contact with key decisionmakers is essential, and tender notices are issued locally and often have short maturity dates.

## Rail Transport

### SYSTEM STRUCTURE AND SIZE

The first railroad built in Iran was completed in 1886. This was an 8-kilometer track built by a Belgian firm which ran from Tehran, the capital city, to Shah-Abdol-Azim, a famous religious shrine. From the 1890's through 1925, several short rail lines were built by foreign oil companies in southern Iran. The establishment of the National Iranian State Railways in 1925 signalled the start of government participation in the expansion of the rail network. The first of these routes was a 1,445-kilometer Trans-Iranian single-track route connecting Tehran with Esfahan, 424 kilometers to the south, Bandar Shahpur on the Persian Gulf, and Bandar Shah on the Caspian Sea. In order to pay for this construction, a tax was imposed on tea and sugar. These lines took a total of 14 years to complete, and included 125 tunnels. At some points they climb to over 7,000 feet above sea level.

**Track and Facilities.**—The Iranian National Railways Corporation (INR) had over 4,500 kilometers of track connecting the major cities of the country in 1976 (see table 1). There was regular passenger service between Tehran, Tabriz, Ahvaz, Khorramshahr, Gorgan, Mashhad, Yazd, Esfahan and Zarand. Newly installed French-built turbotrains carried passengers daily between Tehran and Mash-

had and between Tehran and Esfahan. INR operates international freight and passenger service between Tehran-Tabriz-Razi (at the Irano-Turkish border) and on to Istanbul and other European locations. The Iranian and U.S.S.R. rail networks connect through the Iranian border town of Julfa.

In addition to main track facilities, INR maintains about 1,000 kilometers of freight yard and siding tracks. There are some 2,624 track switching facilities on main lines mostly purchased from Eastern European countries and India; 15% are electrically controlled, the rest manually operated. There are 22 freight car repair depots, four diesel engine repair stations, and nine passenger car repair facilities throughout the country. Track gauge on all major lines in Iran (see table 2) is 1,435 millimeters with the exception of the Mirjaveh-Zahedan line which is 1,676 millimeters.

For the period of Iran's Fifth National Development Plan (1973/74–1977/78) INR was allocated a total of \$1.3 billion for fixed capital expenditures. This allocation is being used for expansion of the existing track network and the purchase of new rolling stock.

**Railway Operations.**—In 1975 INR's gross revenues from passenger and cargo operations amounted to just over \$117 million, a growth of 110% over the 1970 income level. The 1975 expenditures for



**Table 1.—Iran: Rail Transport System, Development Indicators**

	1970	1973	1974	1975	(Estimated) 1976	1980
<b>TRACK NETWORK (in kilometers)</b>						
Main Track Line .....	3,368	4,337	4,344	4,400	4,560	6,400
Rail sidings .....	NA	294	307	324	340	366
Freight yards .....	NA	627	649	681	681	826
<b>ROLLING STOCK</b>						
Locomotives .....	171	269	328	374	374	524
Freight Wagons .....	5,676	6,935	7,235	7,800	8,035	11,000
Oil Tankers .....	1,097	1,637	1,637	1,730	1,750	2,000
Passenger Cars .....	371	374	375	375	375	450
Others Cars .....	62	62	61	61	61	100
<b>CAPITAL INVESTMENT (Million U.S.\$)</b>	16.3	24.4	40.8	73.2	46.8	63.6
<b>RAILWAY OPERATIONS</b>						
Employees (000) .....	29.4	30.8	32.5	33.2	35.0	40.0
Gross revenues (Million U.S.\$) .....	69.7	100.8	122.1	153.0	175.0	256.0
Passengers (Millions) .....	3.7	4.2	4.5	4.7	5.0	8.7
Freight carried (000 tons) .....	3,662	7,113	8,183	9,900	11,300	20,000
Passenger kilometers (millions) .....	1,800	2,189	2,226	2,372	2,543	4,658
Freight ton/kilometers (millions) .....	2,330	4,388	5,410	6,000	7,085	12,700

Source: Iranian National Railways Corporation, Ministry of Roads and Transport, and official Iranian budgets.

salaries, repairs, and the purchase of new equipment totaled \$112 million. Of this amount, \$56 million was spent on the purchase of new rolling stock, \$4.7 million on repairs to worn-out tracks and \$14.1 million on purchases of spare parts and repair machinery. Wages and personnel expenses accounted for \$37.2 million or 33% of total railway expenditures for 1975.

INR hauled 9.9 million tons of goods in 1975, a substantial portion of which consisted of goods moved between ports and inland points. It hauled over 2.1 million tons of oil products; 1.8 million tons of coal, salt, and minerals; and over 1 million tons of agricultural produce. This represented about 12% of the total hauled by all Iranian inland transport. Over 4.7 million passengers were carried in 1975 and passenger services earned \$17.8 million in revenues. Passenger traffic on Iran's rail system increased 5% per year during 1970–75.

**Rolling Stock.**—In 1975 INR had 374 locomotives in operation, almost 40% were powered by diesel engines. Iran purchased 59 new General Motors locomotives in 1975. They will be used mainly to transport coal and ore. Also in 1975, the railways purchased four turbotype locomotives from Ateliers du Nord de la France (ANF) from France for use on its Tehran to Mashhad and Tehran to Esfahan routes. These four engines are used for passenger service and have cut the travel time on these two routes by one-third.

There were 8,322 freight cars in service, of this total 1,750 (21%) were oil and chemical tank cars. The rest included boxcars (about 2,600), open top cars (about 3,000), flat cars (about 600), and hydraulic dumping cars (about 400). Three hundred seventy-five passenger cars were in service. In addition

**Table 2.—Iran: Major Railroad Lines (1975)**

Line	Length (km)	Date Commissioned
Gorgan-Bandar Shah .....	36	1960
Bandar Shah-Tehran .....	464	1937
Tehran-Bandar Shahpur .....	928	1938
Tehran-Tabriz .....	736	1958
Garmsar (Tehran)-Mashhad .....	812	1975
Ahvaz-Khorramshahr .....	129	1942
Qom-Zarand .....	847	1971
Sagsi-Aryamehr Steel Mill .....	112	1971
Sar Bandar-Bandar Mahshahr .....	12	1971
Tabriz-Julfa .....	146	1916
Sufian-Turkish border .....	195	1971
Ajabshir-Bandar Rahmanlou .....	10	1967
Mirjaveh-Zahedan .....	92	1920

Source: Iranian National Railways Corporation.

to freight and passenger cars, the railways operated 36 dining cars, 25 mail cars, and 23 cabooses. It also had 570 hand and repair cars, 71 sliding cranes, and 44 four-cylinder diesel engines.

**Other Railroad Operators.**—The National Iranian Steel Corporation (NISC), which is the government organization operating the Soviet-built Aryamehr Steel Mill in Esfahan, has its own rail system. It was built with the assistance of the U.S.S.R. and uses six locomotives. The National Iranian Steel Industries Corporation (NISIC), another state-owned steel operating company, has purchased two small locomotives from General Electric Company of the United States for use on internal tracks in the Ahvaz direct reduction steel plant. Delivery of these locomotives is scheduled for the beginning of 1978.

These two state-owned companies have the only private-use railroad systems in the country, with the exception of some small ore car operations in the mining industry.

## Government Role

With the exception of the planned subway for Tehran, funded and operated by the Tehran municipality, and internal systems used by industrial complexes, all rail facilities in the country come under the jurisdiction of the Iranian National Railways Corporation. Since 1925, the annual budget for the state railways operation and expansion has come from public funds. In 1976, a bill was presented in Parliament to convert the former Iranian State Railways into a public joint stock company, The Iranian National Railways Corporation. Under this legislation, implemented in April 1977, the railways will be owned 51% by the Government of Iran, while 49% of its shares are to be sold to employees and to private investors. All existing railway installations, tracks, equipment, and rolling stock were transferred to the new company. The public interest in the new company is to be administered by the Ministry of Roads and Transport.

## TRENDS, PROGRAMS, AND PROJECTS

Iran's Fourth National Development Plan (1968/69-1972/73) envisioned an increase in main and branch railway lines to a total of 6,000 kilometers by 1973. The track network amounted to 5,258 kilometers in 1973 or 87% of the distance called for in the Fourth Plan. Total credits of \$211 million were allocated for new expansion during the plan period. Almost 36% of the budget was allocated for the building of railway facilities around the Esfahan Steel complex. During this period, 390 kilometers of rail line were completed, extending the Iranian link of the Trans-Asian Railroad from Kerman to Bam. In contrast, the Fifth National Development Plan (1973/74-1977/78) proposed new rail line construction projects with a total estimated cost of \$1.3 billion. Of this total, \$707 million was scheduled to be spent during the Fifth Plan period while the remaining funds to complete the projects would be allocated during the Sixth Plan.

Among the general goals of the Fifth Development Plan were improved management and accounting methods, increased research and training programs, a freeze on hiring nontechnical personnel, and annual reviews of rates and fares, maintenance facilities, and other installations. Specific projects left unfinished from the Fourth Plan period also were slated for completion. These included some equipment purchases, electrification of the Tabriz-Julfa line, expansion of the line to the Aryamehr Steel Mill, completion of the Kerman-Zarand line, and the construction of a station at Bandar Shahpur.

INR began developing its own long-range (20-year) railroad expansion plan early in the Fifth Plan

period. New projects begun during the Fifth Plan were selected from among the highest priorities of this long range plan. The overall goals of the 20-year railroad plan are: increasing track length to a total of about 17,500 kilometers, linking Mashhad to Chahbahar via Zahedan in the East, linking Iran's south coast port cities and introducing double tracks along heavily used existing track lines. Specific new projects included in the Fifth Development Plan were as follows:

1. Construction of a two-track electric line linking Bandar Abbas-Sirjan-Kerman-Yazd;
2. Construction of a second electric line linking Tehran-Ahvaz-Bandar Shahpur;
3. Construction of a second electric line linking Tehran-Qazvin-Tabriz;
4. Construction of a locomotive repair facility;
5. Construction of four 100,000-square meter warehouses along the Tehran-Qazvin-Bandar Abbas line;
6. Various equipment and rolling stock purchases and maintenance on existing lines.

## Projects

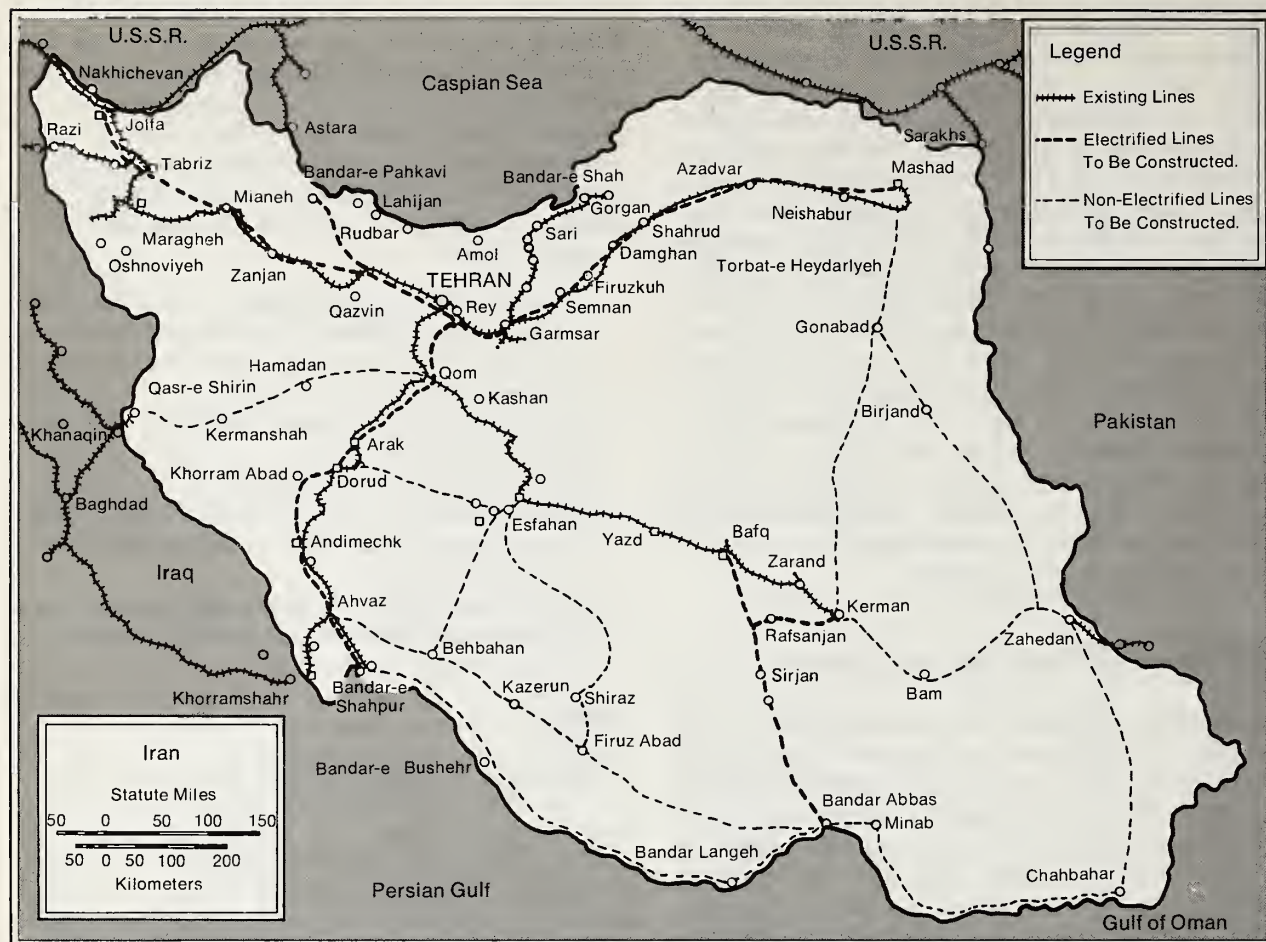
Several of the projects cited above are well on the way toward completion; others have reached only the design stage. The route from Tehran to Tabriz, a major city in northwest Iran, will be expanded to a double electrified track with a complete modernization of the telecommunications and signaling system. Scheduled for completion in 1984, the project's total cost is expected to be over \$1.6 billion. Transmark Limited, a subsidiary of the British National Railways (U.K.) has been awarded the contract for the feasibility study and design of the route. According to an official of the State Railways, the new system will cut travel time for passenger trains on the Tehran to Tabriz route from 16 hours to under 5 hours. The increased speed on the route combined with double track will allow the amount of goods handled to increase from 6,000 to 50,000 tons per day.

The existing route from the Irano-Soviet border town of Julfa to Tabriz will be electrified. A new double track is being built with Soviet technical assistance. This project will help relieve the existing bottleneck at the customs area in Julfa, the major point of entry of all Soviet goods and a substantial portion of goods of European origin.

In order to speed the clearance of goods in the southern ports, double tracking of the Trans-Iranian Railway from Tehran to Bandar Shahpur for 928 kilometers and the electrification of parts of the network are planned. A French consortium was doing overall design work for this project in 1976. It was



FIGURE 1.—Iran: Twenty-Year Railroad Development Plan.



Source: Iranian National Railways Corporation.

expected that construction bids would be accepted sometime in 1978.

The Trans-Asian link from Zarand to Zahedan is under construction. When completed, this track will provide the last portion of the Asia to Europe rail route. The 234-kilometer stretch from Zarand to Kerman will be completed in 1978. During 1978/79 the remaining section from Zahedan to Kerman is expected to be started. It is slated for completion by 1982 and involves the laying of 500 kilometers of track. The Indian government-owned Indian Railways Corporation is carrying out the design studies for a "turnkey" project for this railway.

The "Western Railway Project" will extend the Iranian railway network to the western borders of the country from Arak through Hamedan and Kermanshah to Khosravi at a cost of about \$14.2 million. To open up this section of the country for development, 1,472 kilometers of track will be required. Tenders for this project were slated to be solicited in 1977.

Other projects include the double track electrification of the route between Tehran and Mashhad. It

was being designed in 1977 by the Japan Rail Transport System (JARTS). Tenders for this project will be called for during the Sixth National Development Plan period (1978/79–1982/83).

Work on the building and electrification of a spur railroad linking the Golegozar Iron Ore Mines near Sirjan with the proposed Bandar Abbas rail line may be recontracted in 1977. In 1975, a Romanian firm won a contract for the building of this railroad, but the project was canceled in 1976. Ninety-six kilometers of track are to be laid under this project, which will provide transportation for the iron ore needed for the Bandar Abbas' direct reduction steel mill. Tenders were slated to be solicited in 1977 for another project to lay track to the Bafq iron mines; and tenders for a line from Yazd to Bandar Abbas via Kerman a distance of 262 kilometers were also expected to be solicited in 1977.

**Tehran Subway Project.**—A contract for construction of the linkup of the Tehran International airport by two rail lines has been awarded. A new underground railway costing over \$2 billion was in

the design phase in early 1977. Under an initial \$1.3 billion contract with the Paris Authority for Public Transport (PATP) and its subsidiary company SOFRETU, studies were expected to be completed by the end of 1977, when work on the first of four track lines was expected to start. The 63-kilometer system, when completed in 1986, will be capable of handling 320,000 commuters per hour. The first of the four lines will run from the planned community of Shahrestan Pahlavi, to be built in the northern part of the city, to the Bazaar in the southern district.

## **GROWTH PROSPECTS**

The Government's decision to speed up exploitation of many natural resources has caused a high priority to be given to the development of the rail system. Increased imports and the increased decentralization of industrial centers away from Tehran have added to the impetus for expansion of the railroad system.

The result has been a threefold increase in the level of allocations during the Fifth Plan period when compared to the period of the Fourth Plan. Simultaneously, studies are underway which will result in over \$468 million in new project costs being allocated during the first few years of the Sixth Plan (1978/79–1983/84).

In 1970, 3 million tons of goods were imported. In 1980, it is expected that almost 20 million tons will be imported. Additionally, exports of minerals and manufactured goods are increasing. As mining activity expands, rail cartage of iron ore, coal, and other minerals will rise rapidly and a great amount of new track will have to be laid. Transportation facilities for the movement of basic metals have been given high priority and projects are being implemented to provide rail links between mines and smelters. It is anticipated that transportation of goods from the ports will continue to be a problem in the late 1970's, but the Government is taking the necessary steps to provide the needed rail networks.

There is an unquestionable need for more rolling stock. In 1975 the railways purchased 3,500 box and flatcars to supplement the existing stock of freight cars. However, maintenance improvements and the repair of depots are lagging, and upkeep of roadbeds is still a serious problem. The State Railways recently canceled an option for the purchase of 16 additional turbolocomotives from ANF of France because of maintenance difficulties. Since roadbed repairs are chronically behind schedule, the turbolocomotives already purchased, which are capable of 132 miles per hour speeds, cannot go faster than 75 miles per hour.

The objective of railway development plans is to increase the railway's share of the total inland freight moved to about 40–45% by the end of the Seventh National Development Plan in 1989. On some major freight routes, such as between Bandar Abbas or Bandar Shahpur and Tehran the figure is intended to rise to 75–80% of the total. The plans have been developed to support such growth. The primary constraint on implementing plans for railroad expansion will be whether or not the Government can channel the necessary financial resources into this effort. In spite of the importance of improved rail transport to the development of other sectors of the economy, this objective must compete with others for available resources. It is likely that growth of the rail transport system will continue to be given priority, but that the pace of growth will remain somewhat slower than necessary to meet the Seventh Plan objectives.

## **CAPITAL GOODS MARKET**

The total market for equipment and rolling stock used by INR tripled during the 1973 to 1975 period, from just over \$20 million to \$61 million (see table 3). Almost 30% of this amount was spent in the purchase of new rolling stocks and another 42% was used for the purchase of locomotives. Repair equipment for Iran's existing rolling stock accounted for an additional 18% of all expenditures during the period, while the remainder was used for purchases of control and signaling equipment as well as other rail yard equipment.

### **Imports**

Nearly all of the demand for railroad equipment was supplied by imports. U.S. suppliers accounted for almost 23% of the total purchases of railroad equipment in 1975. They are particularly strong in sales of locomotives.

The Government of Romania in 1975 began delivery of freight cars and other rolling stock through a barter trade agreement signed at the beginning of 1975. Romania supplied almost 19% of all equipment imported by INR in 1975, nearly all of which consisted of railroad freight cars.

Austrian suppliers, who had only a negligible market share in Iran before 1975, supplied over \$6.1 million worth of railroad rolling stock during 1975. French suppliers who had also supplied only a negligible part of Iran's requirements prior to 1975 sold turbolocomotives and passenger cars for use on the Tehran to Mashhad line valued at \$8.8 million in 1975, representing almost 15% of the total railroad equipment market.



## Domestic Manufacture

INR owns two factories which produce oxygen and acetylene gas cylinders used exclusively by the state-owned railroads. Another INR-owned factory produces 153,000 brake linings for use on rolling stock. There are also three INR workshops which fabricate spare parts needed by the railway repair depots. The state railway also owns and operates three railroad tie factories which in 1974 produced 259,000 wooden and 30,000 concrete ties for use in the repair and extension of Iran's rail network. Some rolling stock components, such as wheels and dollies, and brake linings, are produced by the state-owned Arak Machine Manufacturing Company.

**Table 3.—Iran: Size of the Market for Railroad Equipment**  
(thousands of U.S. Dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>LOCOMOTIVES</b>					
Domestic Production .....	—	—	—	—	—
Imports					
United States .....	6,720	23,957	8,945	3,800	7,000
West Germany .....	246	556	115	—	—
Sweden .....	120	32	87	—	—
Japan .....	2,015	0	3,540	—	—
U.S.S.R. ....	99	149	1,723	—	—
Others .....	0	63	642	—	—
Total .....	9,200	24,757	15,052	7,300	16,000
Market Size .....	9,200	24,757	15,052	7,300	16,000
<b>RAILROAD CARS</b>					
Domestic Production .....	—	—	—	—	—
Imports					
United States .....	581	—	197	100	300
West Germany .....	75	—	427	—	—
France .....	—	26	2,536	—	—
Austria .....	—	—	6,154	—	—
Romania .....	—	781	11,411	—	—
Hungary .....	3,384	2,001	823	—	—
Others .....	3,486	978	2,228	—	—
Total .....	7,526	3,786	23,776	13,500	17,500
Market Size .....	7,526	3,786	23,776	13,500	17,500
<b>RAILROAD ROLLING STOCK PARTS</b>					
Domestic Production .....	0	0	0	0	0
Imports					
United States .....	103	280	4,144	2,350	3,800
France .....	2	128	5,891	—	—
West Germany .....	180	739	5,130	—	—
U.S.S.R. ....	463	599	1,571	—	—
Others .....	675	561	651	—	—
Total .....	1,423	2,307	17,387	13,370	12,300
Market Size .....	1,423	2,307	17,387	13,370	12,300
<b>R.R. FIXTURES, SIGNALS, CONTROLS, AND EQUIPMENT</b>					
Domestic Production .....	0	0	0	0	200
Imports					
United States .....	535	688	462	390	500
Japan .....	64	81	35	—	—
France .....	114	28	138	—	—
United Kingdom .....	416	701	570	—	—
Others .....	249	795	245	—	—
Total .....	1,378	2,293	1,450	2,800	3,000
Market Size .....	1,378	2,293	1,450	2,800	3,000

**Table 3.—Iran: Size of the Market for Railroad Equipment—Continued**  
(thousands of U.S. Dollars)

	1973	1974	1975	1976 <sup>1</sup>	1980 <sup>1</sup>
<b>OTHER R.R. EQUIPMENT</b>					
Domestic Production .....	0	0	100	300	800
Imports					
United States .....	133	218	464	370	600
West Germany .....	159	362	938	—	—
France .....	85	148	397	—	—
United Kingdom .....	73	150	296	—	—
Others .....	130	351	1,568	—	—
Total .....	580	1,229	3,663	2,775	5,100
Market Size .....	580	1,229	3,763	3,075	5,900
<b>TOTAL MARKET FOR RAILROAD EQUIPMENT</b>					
Domestic Production .....	0	0	100	300	1,000
Imports					
United States .....	8,072	25,143	14,212	7,010	12,200
West Germany .....	680	1,707	6,710	—	—
France .....	201	383	8,962	—	—
Hungary .....	3,399	2,130	97	—	—
Romania .....	130	913	11,576	—	—
Others .....	7,625	4,096	18,897	—	—
Total .....	20,107	34,372	61,328	39,745	53,900
Market Size .....	20,107	34,372	61,428	40,045	54,900

<sup>1</sup> Estimates.

Source: United Nations, Organization for Economic Cooperation and Development, supplier country, and official Iranian trade statistics; estimates based on trade interviews.

## MARKET OPPORTUNITIES

For the expansion for the railway system, INR will require the following types of equipment and services over the next decade:

**Railway Locomotives.**—INR plans for constructing new lines and expanding passenger service on existing main routes should require an estimated 75–100 electric locomotives. Smaller capacity locomotives, used to haul ore from the mines to new steel complexes, will also be purchased.

**Railroad Rolling Stock.**—INR has completed trade agreements with West Germany, Austria, Romania, and Bulgaria to supply freight and tanker cars over the 1975 to 1978 period. Opportunities for sales of rolling stock will be limited due to these commitments; however, some specialized chemical, service, and passenger cars will be purchased during this period.

**Track Fixtures, Signal Controls, and Other Equipment.**—Expansion of Iran's railway system, together with the building of more depots and siding facilities will require great amounts of track fixtures and signaling equipment. In the case of signs and fixtures, most equipment will be manufactured locally, but other components such as switching and signaling equipment will be imported. Most of the equipment will be manually operated types, and automatic

switching equipment and synchronized signaling apparatus will probably not be purchased until the mid-1980's. Computer-based information and control systems will also be required over the long term.

**Technology and Service Opportunities.**—In the 1976 to 1985 period INR is likely to continue relying on foreign firms for most of the construction, planning, and feasibility studies for new rail lines. Much of this work will be undertaken by government-owned railway corporations, or within the framework of government-to-government agreements. Many major projects will continue to be undertaken on a "turnkey" basis, covering the construction of all track and structures, and power substations.

## MARKETING ENVIRONMENT

### Buyers' Universe

The Iranian National Railways Corporation, whose headquarters is located at the Medan-e-Rah-e-Ahan at the foot of Pahlavi Street in Tehran (site of the Tehran rail terminal), is the only major purchaser of railroad equipment in the country. Performance guarantees and security deposits are regular features for purchases by this organization made on the basis of international tenders.

The National Iranian Steel Company (NISC) and the National Iranian Steel Industries Corporation (NISIC) are the only other purchasers of railroad rolling stock and equipment. These companies purchase equipment through international tenders. Sales to the NISC will be limited over the next 5 years, but the NISIC is expected to purchase a limited amount of railroad rolling stock for new steel plants located in Esfahan, Mashhad, and Ahvaz.

### Foreign Suppliers' Universe

Specialized rolling stock including passenger cars, tankers, and locomotives are supplied by 10 major foreign firms. Diesel locomotives are mainly supplied by General Motors Corporation of the United States and Hitachi Limited of Japan. Other locomotive supplier firms include HRP Limited of the United Kingdom, General Electric Company of the United States and Atelier Du Nord De La France S.A.

Rolling stock is primarily imported from Romania and Bulgaria. Other suppliers include Orenstein-Koppel, Lubeuer Maschinenbau AG., and Koln and Deutzer Fego AG. of West Germany, La Brogeoise and Nivelles SA. of Belgium, Bofors-Nohan AB. of Sweden, and Mitsubishi Ltd. of Japan.

Track fixtures and specialized roadbed equipment are supplied exclusively by U.S.S.R., Romania, India, and Bulgaria. The State Railways in 1977 concluded trade agreements for 250,000 tons of U-33 rails and track switching equipment with Romania and India. Cargo handling is almost totally manual, but Hitachi Limited of Japan has supplied cranes, and Clark Equipment Company of the United States has supplied some small loaders.

Forklifts are supplied primarily by Toyota Company of Japan and Yale Co. of the United States.

### Marketing Factors

Firms interested in bidding on Iranian railroad projects must be listed as approved suppliers by the Ministry of Roads and Transport. Because of past preference considerations in awarding construction contracts, it is advisable to have a contractual relationship with a major Iranian contracting company. Suppliers of yard and loading equipment would be well advised to appoint an effective representative in Iran who can ensure participation in selective tender opportunities. Personal contacts are very important, and only a resident representative can provide the regular ongoing relationships necessary to identify sales prospects on a timely basis. The Japanese, for example, have established a representative office in Tehran and have staffed it with highly competent railroad design and construction personnel.

## COMPETITIVE POSITION OF U.S. SUPPLIERS

Through 1976 U.S. suppliers sold only locomotives to the Iranian railway authorities. Both General Motors and General Electric have full time representatives in Iran. No other U.S. firms are active in the market on a regular basis.

To provide a highly visible presence in Iran and counter the advantages enjoyed by several foreign suppliers through barter and trade protocol arrangements, U.S. suppliers might consider the formation of a consortium made up of railroad engineering firms, railroad construction companies, rolling stock producers, and other specialized firms. The establishment of a U.S. consortium with permanent representation in Iran could go a long way to breaking the near monopoly of certain suppliers. In addition, a consortium would be able to follow up on discussions held by representatives of the U.S. Department of Transportation and Iranian railroad authorities, within the framework of the Iranian-American Joint Commission, and to develop specific project proposals in conjunction with government-to-government technical assistance agreements.



# U.S. Government Services Available to American Exports

## MARKETING ASSISTANCE AND INFORMATION SERVICES

The Office of International Marketing is responsible for developing an effective foreign trade promotion program related to U.S. industry's needs in most U.S. trade areas. Other action units within the Domestic and International Business Administration (DIBA) include: the Bureau of East-West Trade and the Commerce Action Group for the Near East, concentrating special expertise and business services on the trading opportunities in their respective geographic areas; the Office of Export Development, providing vital data on export opportunities and on potential overseas customers; and the Office of Field Operations, delivering all of these services to the American businessman through 43 District Offices.

## Foreign Promotional Events

The Department of Commerce sponsors a variety of promotional events designed to assist American firms and their representatives in developing export markets. Organized and staged by the Office of International Marketing (OIM), the events described below are utilized by U.S. exporters to penetrate the Iranian and other markets, increase sales, and find agents and distributors for their products.

**Commercial Fairs.**—Commerce-sponsored exhibitions of U.S. products of high sales potential, usually of a major single industry staged in important international trade fairs.

**Solo Exhibitions.**—Export promotions planned, mounted, and managed by the U.S. Department of Commerce in markets that offer promising export sales opportunities but which do not afford regularly scheduled fairs for the display of U.S. products to be promoted.

**Trade Missions.**—Organized either by the U.S. Department of Commerce or by an industry group or trade association, trade missions are supported by the Commercial Attaches at U.S. Foreign Service posts overseas. Appointments are made for mission members with important sales prospects and gov-

ernment decisionmakers. Trade missions usually travel to several countries in a region with high sales potential for particular U.S. exports.

**Technical Sales Seminars.**—These events, aimed at high technology markets, combine practical panel discussions by U.S. technology experts with individual private appointments. Additionally, these teams of U.S. industrial representatives on multi-country itineraries receive U.S. Foreign Service briefings, tour local installations, and conduct sales interviews, according to each represented company's marketing objectives.

**Catalog Exhibitions.**—Special displays of company catalogs, usually of a single industry, to test markets, develop sales leads, and locate agents and distributors.

**U.S. Trade Center Exhibits.**—U.S. manufacturers of specific products with prime market prospects and identified end users are drawn together at U.S. trade promotion facilities abroad, backed up by intensive promotion campaigns to attract the right buying audience.

**Between-show Promotions.**—Single U.S. company product or service promotions in U.S. Trade Centers, sponsored, organized, and conducted by the companies themselves or their representatives abroad.

**Joint Export Establishment Promotions (JEEPS).**—Tailor-made promotions designed to help small groups of U.S. manufacturers of related products to inexpensively penetrate new markets on a shared-cost basis.

## U.S. Trade Promotion Facilities Abroad

U.S. trade promotion facilities abroad provide U.S. manufacturers with a unique method of testing and selling in key foreign markets through commercial show rooms established in central marketing areas where the potential for American products is continuous.

There are U.S. trade promotion facilities in the following cities: In Europe—Cologne, London, Milan, Moscow, Paris, Stockholm, Vienna, and War-

saw; in Asia—Osaka, Seoul, Singapore, Taipei, Tehran, and Tokyo; in Australia—Sydney, in the Americas—Mexico City and Sao Paulo.

Information on exhibitions at U.S. trade promotion facilities abroad may be obtained from the Country's Marketing Managers or the Commerce district offices listed on the inside back cover of this Survey.

## Country Consultants

Country Marketing Managers (CMM's) provide U.S. firms with marketing information by specific country, counseling on the preparation of effective marketing plans, aids in selecting best opportunity markets and assistance in participating in Commerce trade promotion activities. The CMM also can assist in obtaining other foreign business information available within the U.S. Government.

In addition, the CMM's receive an enormous quantity of information, both published and unpublished, on their countries. This data comes from private and public sources, American and foreign. It includes periodic reports received from the commercial sections of U.S. Embassies on selected industries or product categories, "best prospects" for sales in the coming year, and new developments and opportunities of special interest to the U.S. business community.

The Country Marketing Manager provides guidance and direction in commercial activities to the U.S. Foreign Service—Department of State, Trade Center Staffs, Commercial Fairs staffs, and other trade promotion personnel. This includes the planning and implementation of trade promotional activities listed earlier ("Global Marketing Program") within the respective country or countries. The CMM is the focal point in Commerce for the development and implementation of the annual Country Commercial Program, jointly prepared by Commerce and the Foreign Service. This operational planning document establishes objectives and priorities for U.S. Government trade promotions and support of U.S. business by country, and the actions to be undertaken to achieve them.

For further information and assistance on marketing in Iran call or write:

Country Marketing Manager—Iran  
DIBA/CAGNE  
U.S. Department of Commerce  
Washington, D.C. 20230  
Telephone: (202) 377-3752

CMM's for other areas are listed on the inside back cover.

## International Marketing Publications

The Bureau of International Commerce makes available to U.S. business a series of publications focusing on foreign market opportunities for U.S. suppliers. The series is made available by the Bureau's Office of International Marketing in cooperation with the U.S. Foreign Service—Department of State. Most reports are based on research conducted by overseas contractors under U.S. Foreign Service supervision or by economic and commercial officers of the Foreign Service or Department of Commerce.

Some of the data in this series is reproduced in its original unevaluated form and the distribution of this document does not necessarily imply the concurrence of the Department of Commerce in the opinions or conclusions contained therein.

As part of its marketing information program, OIM makes available to the U.S. business community, on a continuing basis, seven types of publications and reports.

1. *Global Market Surveys*: In-depth reports covering 20–30 of the best foreign markets for a single U.S. industry or a group of related industries.
2. *Country Market Sectoral Surveys*: In-depth reports covering the most promising U.S. export opportunities in the selected country. About 15 leading industrial sectors are usually included.
3. *Producer Goods Research*: In-depth reports covering the best foreign sales opportunities for a single U.S. producer goods industry, or group of industries.
4. *Consumer Goods Research*: In-depth reports covering the best foreign sales opportunities for a single U.S. consumer goods industry, or group of industries.
5. *Overseas Business Reports*: Reports that include current and detailed marketing information on all leading trading partners. Most are revised annually.
6. *Foreign Economic Trend Reports*: Annual or semiannual reports prepared by the U.S. Foreign Service that cover, individually, almost every country in the world.
7. *International Marketing Events*: Brief market summaries in support of trade promotion events organized by the Office of International Marketing. Also, detailed calendars of upcoming events.

## The Global Marketing Program

The Global Marketing Program is aimed at assisting U.S. industry to develop and expand its exports on a worldwide basis. It involves medium and long term actions by the Government in concert with selected U.S. industries designated as "target industries."



The Program, developed and implemented by the Bureau of International Commerce, provides a wide range of U.S. Government services designed to introduce and promote the sales of American products in the foreign marketplace. Although primary efforts are focused on approximately 15 American industries, the Program and its related services are available to most U.S. firms.

Target industry selections are based on an assessment of each industry's competitive advantages and growth potential in the world marketplace. The Office of International Marketing (OIM) solicits information and assistance from firms and trade associations in each U.S. target industry, in planning the trade promotion programs, in developing market research requirements, in selecting the country markets to be researched, and in determining the viability of Commerce-sponsored trade promotional events abroad.

A Global Marketing Program is prepared for each target industry.

## Global Market Survey

Original foreign market research, conducted in 15 to 25 countries under the supervision of OIM and the U.S. Foreign Service—Department of State, is made available to U.S. firms in each target industry. Additionally, a *Global Market Survey* is made available to U.S. firms upon request. This publication summarizes the comprehensive research to provide a comparative analysis of the country markets surveyed for the U.S. businessman. It is used by many companies in their overseas market planning. It contains supplementary information particularly beneficial in utilizing Government information, financing and other services available to U.S. private enterprise.

## Target Industries

Air and Water Purification and Pollution Control Equipment (1976)  
Laboratory Instruments (1976)  
Business Equipment and Systems (1976)  
Electrical Energy Systems (1977)  
Building Products and Construction Equipment (1977)  
Medical Equipment (1977)  
Communications Equipment and Systems (1977)  
Computers and Peripheral Equipment (1977)  
Graphic Industries Equipment (1977)  
Electronic Components (1977)  
Production Equipment, Test Instrumentation and Special Materials for Electronic Components (1977)  
Process Control Instrumentation (1978)

Food Processing and Packaging Equipment (1978)

Metalworking and Finishing Equipment (1978)

Actual and expected publication times of Global Market Surveys noted in parenthesis.

## Marketing Information and Counseling

Country Marketing Managers assist American companies in increasing their export business in specific countries and regions of the world by providing current marketing information and by working with individual companies in promoting their products.

Commerce District Office account executives provide Global Market Surveys to firms in the "target industry" and work with them in the preparation and implementation of individual company export marketing plans. U.S. firms are invited to participate in a series of Commerce-sponsored overseas commercial exhibitions, trade missions, seminars, and catalog shows scheduled for each industry.

## Export Information Services

The export information services described below can be obtained by contacting the U.S. Department of Commerce, Office of Export Development, Export Information Division, Room 1033, Washington, D.C. 20230, or the nearest of the Department's 43 district offices (listed inside back cover). Recently modernized data handling and retrieval techniques now make many services available in a fraction of the time previously necessary.

**Trade Lists.**—Names and addresses of foreign distributors, agents, purchasers, and other firms are made available to U.S. firms through a series of trade lists. *Business Firms Trade Lists* cover all commercial establishments in small developing countries. *State Trading Organizations Trade Lists* name and describe government-controlled foreign trade organizations in nonmarket economy countries.

**World Traders Data Reports.**—World Traders Data Reports (WTDR's) provide descriptive background information on specific foreign firms. Prepared by the U.S. Foreign Service, the WTDR's include such information as year of establishment, method of operation, lines handled, size of sales territory, name of chief executive, general reputation in trade and financial circles, names and addresses of credit sources, names of the firm's connections, and other commercial information. The complete name, street, and city address of the foreign firm must be given when requesting this service. Nominal fee.

**Agent/Distributor Service.**—The Commerce Department's Agent/Distributor Service helps U.S.

firms find agents or distributors for their products in almost every country of the world. U.S. Foreign Service Officers overseas will identify up to three foreign firms that express interest in a specific U.S. proposal. The charge for this service is \$25.

Application forms (DIB-424P) may be obtained from any Commerce Department district office.

**Export Mailing List Service.**—The Export Mailing List Service (EMLS) provides lists of foreign firms considered prospective customers for U.S. firms. Firms are drawn from the automated Foreign Traders Index. Their names and addresses are available on gummed mailing labels or in standard print-out form. Printouts also include: Name and title of an officer, type of organization, year of establishment, relative size, number of employees and salespersons, and product and/or service codes (Standard Industrial Classification numbers).

A nominal "setup" charge also covers the first 300 entries retrieved. Beyond 300, a small additional cost per name is charged. Delivery can be made in about 15 days.

**Foreign Traders Index (FTI) Data Tape Service.**—This service is offered as a convenience to firms that have a continuing need for a broad range of foreign commercial data, such as export management firms selling a wide range of products. This service provides, in magnetic tape form, information on all firms in one or more countries covered in the Foreign Traders Index. Users may thus retrieve various segments of FTI data by running tapes through their own computer facilities. There is a flat fee for this service on a per-country basis for up to 15 countries. A single, fixed charge is made for a package of 15 or more countries or for the entire file.

## Overseas Business Opportunities

The overseas business opportunities services described below can be obtained by contacting the U.S. Department of Commerce, Office of Export Development, Overseas Business Opportunities Division, Room 2323, Washington, D.C., or the nearest of the Department's 43 district offices.

**TOP.**—The Trade Opportunities Program (TOP) receives trade leads daily from overseas U.S. Foreign Service posts around the world and disseminates them to U.S. suppliers. Trade opportunities are based on inquiries by overseas companies that wish to purchase American products or services, or who are interested in representing U.S. firms. Trade opportunities may come from foreign governments, or even from multinational organizations such as NATO or the U.N.

To register for TOP, U.S. firms are requested to specify their product and country interests and the

types of commercial information desired—direct sales, representation, and/or foreign government tenders. As leads are developed by the Foreign Service, they are cabled to Washington, where they are matched by computer against the criteria established by U.S. companies. These leads are then mailed to appropriate U.S. firms within a week of their origination overseas. Trade leads are charged against prepaid subscriptions.

**Overseas Product Sales Group.**—The Overseas Product Sales Group (OPS) provides personalized assistance to TOP subscribers, or to firms identified as having high export capability, in bidding against foreign competitors for specific export sales opportunities with a value of \$1 million or more. The OPS specialists collect, inventory, and disseminate early information on export sales opportunities from TOP and a variety of other sources.

**Foreign Investment Services Staff.**—The Foreign Investment Services Staff (FISS) is the focal point for American and foreign business inquiries relating to U.S. investment and licensing abroad. American businessmen are assisted in locating potential overseas licensees and partners, are provided with investment data on specific regions and countries, and then guided toward sources of capital for these proposed projects. Foreign investment and licensing proposals for which U.S. participation and technology is sought are published regularly in *Commerce America* and are brought to the direct attention of American firms, where appropriate. In carrying out its broad range of activities, FISS works closely with other U.S. Government assistance sources, multinational agencies, and private regional investment organizations.

## Office of Export Administration

Information on U.S. export control regulations may be obtained from the U.S. Department of Commerce, Bureau of East-West Trade, Office of Export Administration, Washington, D.C. 20230. Telephone: (202) 967-4811.

## EXPORT CREDIT INSURANCE

The Foreign Credit Insurance Association (FCIA) is an association of 53 stock and mutual insurance companies in partnership with the Export-Import Bank of the United States. It offers a comprehensive selection of credit insurance policies which protect policyholders against loss from failure to receive payment from foreign buyers.

The benefits of this coverage may be summed up as follows:

- It protects the exporter against the failure of the buyer to pay his dollar obligation for commercial or political reasons.



- It enables the exporter to offer foreign buyers competitive terms of payment.
- It supports the exporter's prudent penetration of higher risk foreign markets.
- It gives the exporter greater financial liquidity and flexibility in administering his foreign receivables portfolio.

## Who May Be Insured

Virtually any corporation, partnership, or individual doing business in the United States is eligible for FCIA coverage. An exporter may apply for a policy for himself or may become insured under the blanket policy of a bank or other financial institution which holds an FCIA policy.

## Eligible Products

Foreign sales of all types of industrial, agricultural, and commercial products produced in the United States and of services rendered by U.S.-based personnel are eligible for FCIA insurance.

## What Losses are Covered

Comprehensive FCIA policies protect insureds against nonpayment of receivables due to unforeseeable commercial and political occurrences. Commercial risks which are covered include insolvency of the buyer or protracted defaults which may well arise from economic deterioration in the buyer's market area, shifts in demands, unanticipated competition, tariffs, or technological changes. Also covered are defaults due to such buyer problems as increasing expenses, the loss of key personnel, and natural disasters.

Political risks coverage applies to defaults due to governmental action and to political disturbances such as war, revolution, and insurrection. Such events may result in confiscation of the buyer's assets, detention or diversion of shipments, or cancellation of necessary licenses by the United States or by the buyer's country. Also covered is the inability or refusal of the foreign central bank involved to convert the buyer's currency to dollars. Political coverage alone is available for exporters who desire to assume their own commercial risks.

## The Policies

The policies offered by FCIA are many and varied. They can be tailored to suit the needs of the individual exporters, service groups, and financial institutions. Aside from a small applicant fee, all premiums are paid only for goods actually shipped.

*The Master Policy* combines a deductible provision, discretionary credit authority, and once-a-year reporting to provide qualified exporters with

lower premiums, independent credit decisions, faster services to overseas buyers, and less paperwork. It is a blanket policy which requires the exporter to insure all or a reasonable spread of his exportation.

*The Short-Term Policy* is a blanket policy which covers sales on terms of up to 180 days. It provides coverage of 90% for commercial losses and 95% for political losses. A moderate discretionary credit limit is included for each buyer.

*The Medium-Term Policy* provides 90% coverage (political and commercial) for capital and quasicapital goods sold on terms of 181 days to 5 years. The policy is written on a case-by-case basis so an exporter need not insure all his medium-term transactions as he would under a blanket policy.

*The Combination Policy* provides short- and medium-term insurance to protect U.S. exporters in transactions with overseas dealers and distributors. It includes flexible coverage for short-term sales and for both inventory and receivable financing.

*The Comprehensive Services Policy* insures the receivables generated by the performance of services for foreign customers by U.S.-based personnel, or by U.S. personnel temporarily assigned overseas. Industries benefiting from this coverage include management consultants, engineering and related construction consulting services, and transportation companies.

*Special Coverage Endorsements* are available in addition to the above policies. These include endorsements to cover specified preshipment risks and consignment selling.

## An Aid to Financing

FCIA does not finance export sales. However, the exporter who insures his accounts receivable against commercial and political risks is usually able to obtain financing from commercial banks and other lending institutions at lower rates and on more liberal terms than would otherwise be possible.

## Prequalification of Buyers

FCIA's rapidly expanding prequalifying (P.Q.) program is now providing credit information on overseas buyers through its computerization data system. All the exporter needs to do is telephone the nearest FCIA office to determine whether a particular buyer is prequalified for the amount of his purchase.

## Information about FCIA

More information about FCIA's services, and applications for policies, may be obtained through insurance agents or brokers or through FCIA's network or full-service regional offices. General

questions and specific inquiries may be directed toward the FCIA Ombudsman in the New York office. Call (212) 432-6216 for a direct connection.

## **FCIA Offices**

One World Trade Center—9th Floor  
New York, N.Y. 10048  
Phone: (212) 432-6200

1250 South OmniInternational  
Atlanta, Ga. 30303

Suite 1552  
10 South Riverside Plaza  
Chicago, Ill. 60606

Suite 1300  
55 Public Square  
Cleveland, Ohio 44113

Suite 1790  
611 West Sixth Street  
Los Angeles, Calif. 90017

Suite 1110—First Federal Bldg.  
700 North Water Street  
Milwaukee, Wisc. 53202

C&I Building—Suite 1408  
1006 Main Street  
Houston, Tex. 77002

Suite 205  
1 Embarcadero Center  
San Francisco, Calif. 94111

Woodward Building, Suite 420  
15th & H Streets, N.W.  
Washington, D.C. 20005

## **FINANCING EXPORTS SALES**

The Export-Import Bank of the United States (Eximbank) is an independent agency of the United States Government created to facilitate and help finance U.S. exports. It does this through loans to overseas buyers of U.S. equipment and services where the repayment term customary in international commerce exceeds 5 years, and through insurance and guarantees of loans extended by U.S. commercial banks and exporters to finance exports on short and medium term (up to 5 years). Other programs include loans to overseas banks which arrange financing of their customers' import requirements. All disbursements are made against evidence of shipment from the United States.<sup>1</sup>

Equipment and services loans are those extended to non-U.S. buyers of U.S. goods. In a typical in-

stance, a foreign firm seeking to establish a new manufacturing line will obtain financing from Eximbank for a portion of the cost of the U.S. equipment to be purchased. This portion is generally about 40% of the contract price. There is a minimum cash payment of 15% required, and the balance of the financing is obtained from other lenders, occasionally with Eximbank's comprehensive guaranty of repayment. Often Eximbank will require a guarantor on its loan. In authorizing these loans, Eximbank will fix a rate of interest to be paid throughout the life of the loan, the specific rate depending upon the maturity schedule—the longer the repayment terms, the higher the interest rate. Current interest rates are in the range of from 8 to 9% per annum. The rate increases one-eighth of one percent for each additional year of maturity after 5 years from authorization. In addition to the interest rate, Eximbank charges a commitment fee on the undisbursed balance, currently one-half of one percent per annum.

When borrowers are unable to arrange for the balance of the necessary financing on their own strength, Eximbank may issue its repayment guaranty to a U.S. financial institution. The fee charged for this guaranty, as with interest rates on Eximbank loans, is in a range, reflecting both term and Eximbank's assessment of risk. The range currently in use is from one-half of one percent to one and one-half percent per annum on outstanding balances. There is also a commitment fee for financing guarantees, currently one-eighth of one percent per annum on undisbursed balances.

The Cooperative Financing Facility is a program through which Eximbank extends loans to cooperating banks abroad, covering one-half of the financed portion (after the minimum 15% cash payment), for U.S. purchases with the participant providing the remaining financing. This program enables buyers abroad to deal with their own banks, where they are familiar with local laws, language, and customs. Eximbank, on its part, lends to the participating bank and is relieved of the credit risk of the individual buyer. This program is intended for smaller transactions where the maturity of the loan is 5 years or less.

As with most other export credit agencies in industrialized countries, Eximbank operates a supplier credit program. In addition to that of the Foreign Credit Insurance Association discussed above, Eximbank is prepared to extend to participating U.S. banks its comprehensive guaranty of repayment (against specified risks) for nonrecourse export financing extended to their U.S. customers.

Businessmen and bankers—both U.S. and overseas—are invited to make use of Eximbank's counseling services, which include information on money

<sup>1</sup> U.S. businessmen should be aware that not all Export-Import Bank Programs are active in Iran, and they are advised to consult with the Bank regarding the applicability of specific programs in the Iranian market.



markets in the United States, credit information on overseas buyers, and details on each of the programs discussed here.

For further information communicate with Eximbank, 811 Vermont Avenue, N.W., Washington, D.C. 20571—Telex 89-461.

## **OVERSEAS INVESTMENT INSURANCE AND FINANCE**

In keeping with the objectives set forth by Congress, the Overseas Private Investment Corporation (OPIC) is fostering economic progress and development through private enterprise in some 80 friendly lesser developed countries in Africa, Latin America, Asia, and Eastern Europe. It does this by providing qualified U.S. investors—large and small—with political risks insurance and financial assistance to support their investments in these countries.

OPIC insurance and financing are extended to new projects or the expansion of existing projects which are financially sound. All projects OPIC supports must assist in the social and economic development of the host country, and must be consistent with the economic interests of the United States.

### **Insurance Services**

OPIC's insurance program provides coverage, in the areas indicated above, against:

- Inconvertibility of local currency earnings
- Expropriation
- War, revolution, and insurrection

To the private investor interested in establishing operations in the developing nations, political risk insurance is often an essential element in the decision to make a commitment overseas because, although he has the capability to assess the practical business considerations involved, he may find it difficult to judge the country's long-range political climate. OPIC's typical insurance coverage is available for up to 20 years at a combined annual premium of 1.5% for all three coverages. Today, nearly two-thirds of U.S. (nonpetroleum) private investment in the less developed countries is insured by OPIC.

### **Finance Services**

The major objective of the finance program is to assist U.S. lenders and business enterprises in searching out and financing worthwhile private sector projects in the developing world. The three principal means for accomplishing this are OPIC's investment guarantees, its direct loans, and its pre-investment assistance program.

The investment guaranty program protects U.S. firms against loss from commercial and political risks by providing for repayment of principal and interest on loans made to projects in which a U.S. company has a major financial and managerial commitment. The direct investment fund offers long-term direct dollars loans at commercial interest rates to viable projects involved in manufacturing, processing, services, and agribusiness. Guarantees are available for mining and other natural resource projects. The preinvestment survey program is designed to assist investors on a risk-sharing basis in finding viable projects in the developing nations.

# Appendix I

## MARKETING AND IMPORT PROCEDURES

**Import Procedures.**—Only firms and individuals holding a valid “trading card” issued by the Ministry of Commerce may import goods into Iran. Because of the many time-consuming problems involved with import procedures, many firms have found it advantageous to use the services of professional freight forwarders. Most firms also have staff personnel who handle freight and customs matters exclusively; this is usually the case even with relatively small firms.

All orders for imports must be registered with the Central Bank of Iran (Bank Markazi Iran) through an authorized bank on the basis of a pro forma invoice. A nonrefundable fee of 1% of the invoice value is charged for this service. The importer's bank will then provide a registration number for the order, which must subsequently appear on all shipping documents. This registration requirement applies to all imports, whether for the public or private sector.

Irrevocable, sight letters of credit are commonly used in Iran as a payment mechanism for imports, and most banks provide this service. Suppliers have generally preferred an irrevocable, sight letter of credit.

All duties levied are payable in rials at rates of exchange fixed by the Central Bank. Goods generally may not be opened or removed from the storage area until all duties are paid and the proper documentation work is completed.

**Banking and Credit.**—All banks in Iran are authorized to handle foreign exchange transactions (see also the Government, Business, and Financial Establishments chapter). All foreign exchange controls were lifted by the Government in January 1974. Extraordinarily large transfers out of the country may require some phasing depending on the bank involved. Both residents and nonresidents may hold foreign currency deposits in Iranian banks.

Bank interest rates for short term credit ran from 11 to 13% per annum in early 1977. Commercial banks typically lend up to a maximum of 1 year. “Roll-over” loans are, however, fairly common in

Iran. Development banks lent at 9% per annum for medium term loans in early 1977, although such loans are invariably related to projects financed by these banks. Long term commercial credit is simply not available in Iran.

Interest rates for deposits held in foreign currency are not regulated, and are thus left to the discretion of individual banks. For rial deposits, normal “passbook” accounts earned 7% in early 1977, and 1-year time deposits earned 9 to 10%.

There is a fairly well developed market for discounting bills and other commercial paper (see chapter cited above), in the traditional “bazaar” money market at rates considerably higher than commercial bank rates.

## Import Regulations

Iran's import system is essentially a free system in which market forces determine import priorities. Some barriers have been erected to protect growing domestic industries, and tariffs are relatively high on goods not essential to economic development. The importance of certain items of basic consumption (e.g., food grains, sugar, edible oils) are predominantly but not exclusively handled by governmental organizations.

**Import Tariff Structure.**—Iran adopted the Brussels Tariff Nomenclature (BTN) in March, 1973. This considerably simplified its tariff system. However, a considerable degree of ambiguity in interpretation of the BTN classifications may complicate the importation of certain goods. In the final analysis the actual assessment of any product or piece of equipment by customs authorities is the determining factor in classification.

Imports fall generally into the following four categories:

1. “Authorized” (Goods may be imported generally free of any quantitative restrictions, or without the imposition of customs duties).
2. “Authorized—with prior approval” (Goods generally manufactured in Iran, but not in sufficient quantity to satisfy domestic requirements; approval is obtained from the Minis-



try of Commerce usually in consultation with the Ministry of Mines and Industries.)

3. "Unauthorized" (Certain luxury goods and others produced locally in sufficient quantity for local needs; the Ministry of Commerce may authorize specific imports from this category).
4. "Prohibited" (Goods excluded by statute; generally the only exception is for government or specially authorized purchases e.g., fire-arms, narcotic drugs, radio transmitters).

Import duties are almost without exception ad valorem and are based on the c.i.f. value of the goods. In addition a surcharge known as the Commercial Benefit Tax (CBT) may be levied. It is based on either the c.i.f. value of the goods or on a specific charge by weight. In practice, the CBT is a supplementary duty. Purchases made by governmental and quasi-governmental public service organizations may be exempt from import tariffs, including the CBT. At the beginning of each Iranian year (March 21) the Government issues "General Export-Import Regulations" designed to influence the flow of imports to meet shifting needs and policy objectives. In these annual import regulations items may be shifted on the lists of authorized, unauthorized, and prohibited items, and the CBT may be adjusted upward, downward, or eliminated as necessary.

**Internal Taxes.**—Municipal taxes are assessed on all imports and sales of domestically manufactured equipment; they range from 1 to 1.5% of the c.i.f. value of the goods. Ports handling fees are also charged by weight, and vary slightly from port to port. An average figure of 400 rials per ton was charged in early 1977.

There are two fixed taxes levied on all imports regardless of port of entry: (a) a tax levied by the Ministry of the Interior at 6% of the duty assessed, and (b) a tax of 1.5% of the duty assessed for the benefit of the Red Lion and Sun Society (Iran's Red Cross).

Information regarding Iran's duties applicable to specific products may be obtained free of charge from: Country Marketing Manager for Iran, CAGNE, U.S. Department of Commerce, Washington, D.C. 20230; or from any Department of Commerce District Office. Inquiries should contain a complete product description, including BTN, SITC, or U.S. Schedule B Export Commodity numbers, if known.

**Shipping Documents.**—Air and surface freight shipments to Iran generally require the following documentation:

(1) Commercial invoice (itemizing current export prices, cartage, freight charges, and insurance; prepared in quadruplicate; certified by the shipper and by an officially recognized chamber of commerce in the United States; legalized by an Iranian Consul);

(2) Certificate of origin (indicating country of origin, names of shipper and consignee, and a statement of the goods as to kind, weight, and quantity; certified by an American chamber of commerce; legalized by an Iranian Consul; prepared in triplicate; original sent to consignee in care of his Iranian bank);

(3) Bill of lading (no special requirements; two original copies sent to consignee in care of his bank.)

Documentation should not list the term "Arabian Gulf" for the geographic area known as the "Persian Gulf."

**Packaging, Marking, and Labeling Requirements.**

—All goods consigned to Iran should be packed to withstand rough handling, extreme heat, water damage, and attempts at pilferage. All packages should show gross weight in kilograms or metric tons. Packing lists should be complete and accurate, and labeling should also avoid the term "Arabian Gulf." Inaccurate packing lists may lead to inordinate problems and extra expense when clearing goods from customs.

**Samples and Advertising Matter.**—Iran is a signatory to the International Convention to Facilitate the Importation of Commercial Samples and Advertising Materials. Samples of no commercial value are normally admitted duty free. Other samples of dutiable goods may be entered if a bond, normally three times the duty value, is posted. As with other customs procedures, however, the actual assessment of customs officials is the determining factor in the importation of these items.

**Shipping.**—U.S. flag carriers provide services to Iran from Gulf and East Coast ports, and West Coast cargos are accommodated by "miniland bridge". In addition to direct shipments to Iran's Persian Gulf ports, other shipping routes used with some success by firms active in Iran are (1) to Turkish ports (principally Istanbul and Eskenderun), then by truck to Iran, and (2) to the Soviet Baltic ports, through the U.S.S.R.'s inland waterway network to Caspian Sea ports, then by train or truck to the final destination in Iran. The latter route, however, is only usable from late spring through early fall. Overland shipping from Europe, especially from Hamburg, Germany, is also frequently used.

U.S. flag carriers which offer service to Iran include the following: Waterman Steamship Corp. and Central Gulf Lines offer LASH service from East Coast and Gulf Ports direct to the Persian Gulf. American Export Lines and Sea-land Service

offer combined sea and overland routes via Mediterranean ports from the East and Gulf Coasts. Pacific Far East Lines offers direct "Roll-On/Roll-Off" service to Iran via East Coast ports.

**Military Procurement.**—Purchasing by the Imperial Armed Forces is handled by several organizations:

The Ministry of War Procurement Office located at Saltanat Abad in Tehran, is under the direction of the Vice-Minister of War. This office concerns itself primarily with military equipment and spare parts and large scale purchases, including construction projects, but also makes other purchases which serve both consumer and industrial elements of the military complex.

The Military Industrial Organization (MIO) is a commercial company formed primarily to undertake manufacturing ventures under joint equity or licensing arrangements for products of use to the armed forces (for example, batteries are manufactured in Iran by a company organized under the MIO. The Vice-Minister of War also acts as Managing Director of MIO. The MIO's purchasing office is also located in Saltanat Abad.

Each of the three armed services has procurement offices for expendable supplies and smaller scale purchases, as follows:

1. Imperial Iranian Air Force, located at Doshan Tapeh, Tehran
2. Imperial Iranian Ground Forces, located at Bagh-e-Shah in Tehran
3. Imperial Iranian Navy, located at Old Shemiran Road, Abbasabad, Teheran
4. ETKA (Distribution Cooperative Organization) located on Sepah Avenue, Bastiun, in Tehran, primarily procures food for the military services. ETKA also operates military cooperative stores as well as a number of agrobusiness industries (chicken and sheep-raising projects, vegetable oils, etc.).

In most instances, except for items which clearly fall in the commodity/food area, inquiries from companies outside of Iran should be made to the Ministry of War (Cable Address: SANAYENE-ZAMI, Tehran 16, Telex: 212703, Telephone 281728). As appropriate or necessary, such inquiries will be dealt with in that office or referred to one of the other procurement offices discussed above.

The Ministry of War has decreed that it and its related offices will not deal with agents. All foreign firms desiring to supply the military complex should deal directly with one of the four offices listed above rather than employing an agent or other type of intermediary. The Ministry of War and related

offices also reserve the right to request potential suppliers to provide an affidavit in which an authorized officer of the company (usually construed to mean the individual empowered to sign the contract) swears under oath that his company has not paid fees or extracontractual payments to agents or any other parties in pursuit of contracts. In practice these affidavits are being requested in connection with submission of bids as well as signing of contracts. Such an affidavit needs to be sworn to before and notarized by a consular officer of the appropriate embassy in Iran. Companies or individuals in the United States having questions about this procedure may consult the Iranian Embassy in Washington.

**Advertising.**—As with most aspects of commercial activity in Iran, the advertising media are concentrated in Tehran. Newspaper advertising, given the limited number of trade publications, is highly recommended for introducing a product. Four daily newspapers in the Farsi language are distributed nationally. They had a combined circulation of about 700,000 in 1976. These newspapers are Kayhan, Ettala'at, Rastakhiz, and Ayendegan (for more detailed information on printed media see chapter on Printing and Publishing). There are also a number of foreign language newspapers. Two domestic business magazines which may be useful for product promotion are the monthly *Iran Trade and Industry*, published by Echo Publications of Tehran (U.S. representative Box 1271, Englewood Cliffs, New Jersey, 07632) and the weekly *Tehran Economist*, published by the Economist Press (99 Sevome Esfand Ave., Tehran, 11, Iran). Regional magazines such as *The Middle East*, *The Middle East Economic Digest*, and *Middle East Business* have a substantial circulation in Iranian business and government circles.

Advertising in printed media is somewhat expensive, but represents the most useful general promotional vehicle available. In late 1976 the cost of a 1-day two-column 200-line advertisement on page 10 of Kayhan's Farsi daily was about 12,000 rials (about \$170). A full page advertisement in the *The Tehran Economist* ranged from 27,000 rials (\$383) to 40,000 rials (\$567).

Advertising is accepted by both the Government-controlled radio and television. Advertising agencies are plentiful, but only a few can provide a full range of services and performance of high standard.

**Market Research Organizations.**—There are only a few firms engaged in market research in Iran. The field is new to the country, and the work involved is difficult because detailed statistical information on relevant indicators is not readily available. Information on these firms and other



marketing services available in Tehran may be obtained from the Commercial Section of the American Embassy.

**Trade Associations.**—The major trade association in Iran is the Iran Chamber of Commerce, Industry and Mines, 254 Avenue Takht-e-Jamshid, Tehran (located next door to the American Embassy). The Chamber, founded in 1970, can provide useful information and contacts for businessmen new to Iran. The Chamber also publishes a weekly bulletin, which accepts limited advertising and can be a useful promotional vehicle. There are a number of specialized trade and professional associations in Iran. Leading groups are identified in each of the industry reports in this survey.

In Tehran, the Iran-American Chamber of Commerce is located in the Iranians' Bank Building on Takht-e-Jamshid Avenue (Address: Iran American Chamber of Commerce, 7th Floor, Iranians' Bank Building Takht-e-Jamshid Ave., Tehran 15, Iran. Phone: 891168, 895149. Telex: 212418 LION IR. Cable: IRANAMCHAM TEHRAN). Founded in 1973, its membership represents the leading U.S. firms in Iran and many leading Iranian firms. The Chamber works closely with the U.S. Embassy to further U.S. business relationships in Iran, and is prepared to assist American firms in assessing Iranian business prospects and in establishing themselves in Iran. A monthly bulletin is published by the Chamber, which also provides a directory of its membership at a nominal cost to nonmembers. The Chamber has corporate and individual resident and nonresident memberships.

**U.S. Trade Center.**—Inaugurated in 1973, the U.S. Trade Center serves American manufacturers in introducing their products in Iran, finding representation, or expanding sales for those already established in the market. Trade Center planning for future events is based on a regular program of market research and consultation in an effort to be responsive to the needs of Iran's public and private sectors. Among the activities of the Trade Center are (1) official multicompany exhibitions, organized around specific product or industry themes; (2) privately sponsored presentations, usually arranged by an individual firm, and involving either product demonstrations, sales seminars, workshops, hospitality events, or other promotional activities; (3) window displays promoting U.S. products or services. The Trade Center has a main hall exhibition space of 2,130 square feet, and a conference room of 258 square feet with an adjoining lounge area of 200 square feet. Current information on the Trade Center's schedule of events, participation fees and other services may be obtained by contacting either:

The Director, U.S. Trade Center, 61 Blvd. Elizabeth, P.O. Box 50, Tehran (Telex No. 213179 USTC IR); or

Commerce Action Group for the Near East (CAGNE), Bureau of International Commerce, Dept. of Commerce, Washington, D.C. 20230; or

any Dept. of Commerce District Office in the United States.

The Trade Center's official multicompany exhibition schedule for the latter quarter of 1977 and the first half of 1978 follows:

October 2-6, 1977: Hi-Fi/Stereo and Home Appliances

December 4-8, 1977: Building and Construction Materials and Equipment

January 1978: Chemical and Petrochemical Equipment

March 5-9, 1978: Food Processing and Packaging Equipment

June 4-8, 1978: Warehousing Systems

**Trade Missions.**—Many U.S. businessmen have found that joining a U.S. Department of Commerce-sponsored trade mission to Iran is a useful method for initially testing the market. Trade missions are organized by the Special Activities Division of the Office of International Marketing, Department of Commerce, Washington, D.C. 20230. A number of U.S. trade missions are organized by the export promotion offices of the States.

**Tehran International Trade Fair (TITF).**—The International Fairs and Exhibitions Corporation, associated with the Ministry of Commerce, organizes an annual general trade fair (held in September) and several, smaller specialty fairs. Many U.S. firms have found the TITF to be a useful medium for market promotion. Current information on the exhibition schedule and participation fees may be obtained by writing directly to: Iran International Fairs and Exhibitions Corporation, P.O. Box 33-22, Tehran, Iran (telex No. 212896).

The following is the TITF schedule for 1977/78; this listing was current as of early 1977, but is subject to change.

October 28—November 4, 1977: AGWA-Food Fair (Agriculture-Water Resources Food Products & Equipment)

April 20—May 2, 1978: 1st Afro-Asian Small Industry International Fair

May 2-18, 1978: International Furniture and Interior Decoration Fair

June 20-26, 1978: Construction, Furniture, and Interior Decoration Fair

Mid-September 1978: 6th International Tehran Trade Fair

November 12-18, 1978: Iran-Med Fair (medical equipment) and International Educational and Training Equipment Fair

## GENERAL INFORMATION

**Visiting Iran.**—Iran is easily accessible by air from all major cities of the world. The majority of international flights land at Tehran's Mehrabad Airport, although there are a few flights connecting cities in Southern Iran with various Persian Gulf capitals. Pan American provides regular service to Tehran. Domestic air services connect Tehran with the major provincial business centers.

Making business calls in Tehran is considerably more difficult than in industrialized countries because of telephone problems, heavy traffic during business hours, and the somewhat casual attitude toward punctuality which some Iranians maintain. Since it is hard to keep more than three or four appointments during a working day, a minimum of 1 week should be allotted even for an initial survey of the market. Business hours vary from office to office, but most private and governmental offices are open at least 5 days per week, Saturday through Wednesday. Some offices remain open on Thursdays, although many only for the morning. On Fridays all offices are closed. Daily hours run from 7:30 to 9 a.m. for the opening of business, with closing times ranging from 4:30 to 7 p.m. depending upon how long the office closes for lunch, if at all. Business entertainment is customary and widespread; a number of excellent restaurants thrive on the business luncheon trade, and reservations are usually advisable.

**Climate and Dress.**—Tehran's climate has often been compared with that of Salt Lake City. Winters, while cold, are usually mild and snow is generally limited to January and February. While summer temperatures can be fairly high, the air is quite dry and this tends to lessen one's discomfort from the heat. Tehran has a relatively high level of air pollution, and people with respiratory problems often experience difficulty. Iranian businessmen invariably wear fashionable but conservative suits during business hours and at social functions.

**Holidays.**—A number of religious and secular holidays are customarily observed in Iran. Some holidays are on a fixed date while others vary with the lunar calendar. Many religious holidays are associated with the death of Islamic religious figures and are regarded as days of "deep mourning." In 1977 Iranian businesses and government offices are closed on the following holidays: January 1, Ashura (deep mourning); February 17, deaths of the Prophet Mohammad and of Imam Hassan; March 8, birthdays of the Prophet Mohammad and of Imam Jaafar Sadeh; March 21 and 22, No-Ruz (first and second days of Iranian New Year); April 2, Sizdah (13th day of Iranian New Year); July 15, Mabas

(celebrates first revelation to the Prophet Mohammad); August 1, birthday of the 12th Imam; August 5, Constitution Day; September 6, death of Imam Ali; September 15, Id-e-Fitr (first day after Ramazan, Islamic month of fasting known as Ramadan in other Muslim countries); October 9, death of Imam Jaafar Sadeh; October 25, birthday of Imam Reza; October 26, birthday of His Imperial Majesty, the Shah of Iran; November 22, Id-e-Gnorbaban (commemorates the sacrifice of Abraham); November 30, Id-e-Ghadir (celebrates Ali's succession to the Prophet Mohammad); December 21, Ashura (deep mourning).

Although this holiday listing cites only 2 days for No-Ruz, the Iranian New Year, actual practice is such that virtually all businesses and government offices are reduced to skeleton staffs and minimal activity from about March 15 through April 3. Business visits to Iran during this period are not likely to be productive as many decisionmakers use this time for vacations outside of Tehran.

**Visas.**—A visa is required for a visit to Iran of any duration. Visas may be obtained from the Consular Section of the Imperial Embassy of Iran, 3005 Wisconsin Ave., N.W., Washington, D.C. 20008; the Consulate General of Iran, 630 Fifth Avenue, New York, N.Y., 10020; the Consulate General of Iran, 875 Michigan Avenue, Chicago, Ill., 60611; and the Consulate General of Iran, One Embarcadero Center, Suite 1301, San Francisco, Calif. 94102.

**Work and Residence Permits.**—Foreigners working in Iran must have a valid work permit issued by the Foreign Residents Bureau of the Ministry of Labor (location: Villa Avenue at Nasser Street, Tehran). Application is made by the employer on behalf of the employee; it is illegal to work in Iran without such a permit. Those holding work permits, and their nonemployed dependents, must also have a residence permit. This permit is issued by the same office, but only after the work permit has been approved. Since these permits are not issued simultaneously they thus expire at different times. It is the responsibility of the permit holder to make application for renewal on a timely basis, and 1 month prior to the expiration date is generally suggested as an appropriate time to apply. Fines may be imposed on those who work beyond the expiration date of their permit.

**Taxation.**—Iran assesses taxes on both corporate and personal incomes. Tax rates vary according to the legal form of the firm, with the most general division being between private joint stock companies (known locally as *sherkat-e-sahami khas*) and branches or limited liability partnerships. Individual income tax rates are generally uniform. As an exam-



ple of individual rates in late 1976, incomes of less than \$2,045 per annum were exempt, and incomes of between \$28,370 and \$56,738 were assessed 26% of the amount over the lower figure, and a base tax of 10% of the amount over \$18,724.

The Iranian tax code is sufficiently complex to warrant a firm seeking expert advice prior to appointing a representative in Iran or establishing an office of any kind. In addition, Iranian tax inspectors have the right to reject corporate and individual accounts and make arbitrary tax assessments should they suspect any inaccuracy. As of early 1977 no double taxation treaty existed between the United States and Iran. Taxes are also assessed on all contracts for construction, transport, design, surveys, etc., and on all capital gains.

**Health.**—Visitors to Iran should be vaccinated against smallpox and cholera. While not required, health authorities recommend that vaccinations also be obtained against tetanus, typhoid, and typhus. City water is potable in Tehran, but many travelers have found it useful to carry medication for stomach and intestinal ailments. Such medication is readily available in many Tehran pharmacies. Competent doctors and dentists are available for emergency consultations.

**Currency.**—The Iranian currency is the rial, and the early 1977 exchange rate was 70.5 rials to one U.S. dollar. There are no restrictions on the conversion of dollars into rials when entering the country or on reconversion upon departure.

A monetary term used often in Iran is *toman*, one of which represents 10 rials. There is no coin or bank note issued in *tomans*, however; it is simply a term of common usage in which prices are often quoted in shops and in the bazaar.

Travelers' checks can be cashed at most hotels and banks, and credit cards are widely used but not universally accepted. Most Iranian banks are open from 8 a.m. to 12:30 p.m., and again from 5 to 7 p.m.

**Other Information for Businessmen.**—Baggage at Mehrabad Airport is picked up from a conveyor system after the passenger completes health and passport formalities. Uniformed porters are available, and as of early 1977 an acceptable tip was 25 rials per bag. Customs inspections may be thorough, but legitimate business visitors are passed with little difficulty by customs officials. Hand carried articles of great value may be entered into the traveler's passport to assure reexportation at the end of his visit. Newly arrived visitors should proceed to the front of the terminal, where taxis are usually available. Most taxi drivers will try to accommodate as many passengers as possible; passengers may have to

insist on limiting the load and be prepared to take another taxi if the driver is uncooperative. The fare from Mehrabad to the downtown area should not exceed 300 rials, and it is best to determine the fare before beginning the ride. Most drivers understand minimal English.

There are a number of international standard hotels in Tehran, where good accommodations may be had for \$35 to \$50 per day for a single room (early 1977). Reservations are almost always necessary. Leading hotels in this category include the Royal Tehran Hilton, the Arya-Sheraton and the Tehran Intercontinental. Many other hotels are available, and their rates (as well as standards) are somewhat lower. A 15% service charge is normally added to the bill in all hotels and restaurants. This charge, however, should be supplemented by tips for individual services by another 5 to 10% depending on the quality of the services.

"Telephone taxis" probably represent the most efficient form of transportation for the business visitor. They are available at hotels and are hired by the hour (early 1977 rates were approximately 250 rials per hour for one to four passengers). Other taxis (orange and blue) generally follow fixed routes and accommodate as many passengers as the driver can persuade those already inside to accept. These taxis are metered, and one calculates the fare by subtracting the meter reading upon entering from that when one departs and adding a few rials for a tip. Such taxis are better for more adventurous visitors only, since some familiarity with the city and language is necessary in using these taxis.

Tehran has a number of good restaurants, ranging in culinary specialties from French haute cuisine to pizza and enchiladas. Of special interest are the many restaurants which serve chelo kebabs, one of Iran's most popular dishes. These restaurants are usually only open for lunch and only serve chelo kebabs, tender lamb or beef kebabs served on a steaming bed of buttered rice, and made even more tantalizing by a variety of condiments. Chelo kebabs, and other Persian specialties, are well worth sampling during a visit to Tehran, and some familiarity with these dishes will undoubtedly please one's Iranian business associates.

**Communications.**—International airmail service to and from Tehran is relatively reliable. International telegraph, telex, and telephone service is widely available. Internal telephone connections are often difficult to make, and calls within the city may consume an inordinate length of time. There is no reliable telephone directory, and the telephone information service (dial 118) is often less than informative. Telephone lines are in short supply.

## Infrastructure

The growth of Iran's basic infrastructure, while impressive, has not kept pace with the growth of demands made upon it. Of interest to American businessmen contemplating entry into the Iranian market are the following problem areas:

**Traffic and Transportation.**—On the streets of Tehran and on major highways traffic is heavy, relatively undisciplined, and often dangerous. Inordinate amounts of time are consumed in getting from one place to another in Tehran, and public transportation facilities are still inadequate. The costs of buying and renting cars are high (e.g., the cheapest locally assembled Chevrolet with a 6-cylinder, 2,500 cc. engine, carried a base price of about \$10,000 in early 1977; hiring a car and driver at the same time was about \$4.25 per hour). Imported cars are considerably more expensive than those assembled locally.

**Housing and Office Space.**—All housing in Tehran is expensive, as is office space. In early 1977 a second floor, 3- or 4-bedroom apartment of minimal acceptable standards rented for approximately \$1,000 per month, exclusive of all utilities. Problems with plumbing, electrical wiring, and even structural defects are endemic; services for such problems are scarce and relatively expensive. All furniture and household appliance items are expensive by U.S. standards, whether locally produced or imported.

**Personnel.**—Clerical staff and skilled personnel are also scarce and expensive. A salary of \$1,000 per month was not uncommon for a good bilingual secretary in early 1977. Top graduates from the Iran Center for Management Studies, affiliated with the Harvard Business School, reportedly received starting salaries of around \$2,000 per month for essentially "management trainee" jobs in 1976.

**Government Representation.**—Iran is represented in the United States by its Embassy at 3005 Massachusetts Avenue N.W., Washington, D.C. 20008, and by three consulates general (see earlier section on "visas" for addresses).

The United States maintains an Embassy in Tehran at 260 Takht-e-Jamshid Avenue, between

Roosevelt Avenue and American Alley. It also has consulates in the cities of Tabriz, Shiraz, and Isfahan. U.S. Foreign Service Officers in the Economic/Commercial Section of the Embassy and at the consulates are available to assist visiting American businessmen. Embassy hours are 7:30 a.m. to 4:00 p.m., Sunday through Thursday.

## Reading List

"A Survey of Iran: Quiet Thee Now and Rest," *The Economist*, London, August 28, 1976.

*Area Handbook for Iran*, DA Pam No. 550-68, Foreign Area Studies, The American University, Washington, D.C., available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. (under revision, 1977).

*American Business Community in Iran*, Iran-American Chamber of Commerce, Tehran (annual).

*Foreign Economic Trends and Their Implications for the United States-Iran*, American Embassy, Tehran (semiannual).

*Iran*, The Chase World Information Series on Developing Business in the Middle East and North Africa, Chase World Information Corporation, New York, 1976.

*Iran Almanac and Book of Facts*, Echo of Iran, Shiraz Avenue, Tehran (annual).

*Iran: A MEED Special Report*, Middle East Economic Digest, London, February 1977.

*Iran Yearbook*, Kayhan Research Associates, Tehran (annual).

*Iran Trade and Industry*, Echo of Iran, Tehran (monthly).

*Iran-American Economic Survey, 1976/2535*, Iran-American Chamber of Commerce (U.S.), New York, (annual).

*Iran's 5th Plan*, Kayhan Research Associates, Ferdowsi Avenue, Tehran.

*Marketing In Iran*, OBR 74-36, August 1974, U.S. Department of Commerce (under revision, 1977).

*Iran Recent Economic Developments*, International Monetary Fund, Washington, May 1977.

*Tehran Economist*, Economist Press, Tehran, (weekly).



## Appendix II

### ADDRESSES OF IRANIAN GOVERNMENT MINISTRIES

Agriculture and Natural Resources, Elizabeth Boulevard, Tehran; Tel. 927831-2  
(Merged with Cooperatives and Rural Affairs 1977)

Art and Culture, Kamalomolk Avenue, Tehran; Tel. 303581-(5)

Commerce, Ark Square, corner of Golesten Palace, Tehran; Tel. 531184

Education, Ekabatan Avenue, Tehran; Tel. 304207

Economic Affairs and Finance, Davar Avenue, Tehran; Tel. 313365

Energy, Varzesh Avenue, Tehran; Tel. 311051-(4)

Foreign Affairs, Foroghi Avenue, Tehran; Tel. 3211-875353

Health, Korosh Kabir Avenue, Tehran; Tel. 760293-(4)  
(Merged with Social Welfare, 1976)

Housing and Urban Planning, Varzesh Avenue, Tehran; Tel. 668311-(19)

Imperial Court, Pastor Avenue, Tehran; Tel. 45171-(9)

Industry and Mines, Ark Square and Davar Avenue, Tehran; Tel. 531539, 533991

Information and Tourism, Ark Square, Tehran; Tel. 530163-(5)

Interior and Civil Service Affairs, Jark Shahr Avenue South, Tehran; Tel. 24021 (29)

Labor and Social Affairs, Ezezhaver Avenue, Tehran; Tel. 933031-(9)

Post, Telephone and Telegraph, Bism Qasr Avenue, Tehran; Tel. 840875

Roads and Transport, Ark Square, Tehran; Tel. 531191-(3)

Science and Higher Education, Villa Avenue, Tehran; Tel. 8141-821107

War, Sevome Esfand Avenue, Tehran; Tel. 311126-(30)







## Commerce District Offices

Albuquerque, 87101, (505) 766-2386.  
 Anchorage, 99501, (907) 265-5307.  
 Atlanta, 30309, (404) 881-7000.  
 Baltimore, 21202, (301) 962-3560.  
 Birmingham, Ala., 32505, (205) 254-1331.  
 Boston, 02116, (617) 223-2312.  
 Buffalo, N.Y., 14202, (716) 842-3208.  
 Charleston, W.Va., 25301, (304) 343-6181, Ext. 375.  
 Cheyenne, 82001, (307) 778-2220, Ext. 2151.  
 Chicago, 60603, (312) 353-4450.  
 Cincinnati, 45202, (513) 684-2944.  
 Cleveland, 44114, (216) 522-4750.  
 Columbia, S.C., 29204, (803) 765-5345.  
 Dallas, 75202, (214) 749-1515.  
 Denver, 80202, (303) 837-3246.  
 Des Moines, 50309, (515) 284-4222.  
 Detroit, 48226, (313) 226-3650.  
 Greensboro, N.C., 37402, (919) 378-5345.  
 Hartford, 06103, (203) 244-3530.  
 Honolulu, 96813, (808) 546-8694.  
 Houston, 77002, (713) 226-4231.  
 Indianapolis, 46204, (317) 269-6214.  
 Los Angeles, 90024, (213) 824-7591.  
 Memphis, 38103, (901) 521-3213.  
 Miami, 33130, (305) 350-5267.  
 Milwaukee, 53202, (414) 224-3473.  
 Minneapolis, 55401, (612) 725-2133.  
 New Orleans, 70130, (504) 589-6546.  
 New York, 10007, (212) 264-0634.  
 Newark, N.J., 07102, (201) 645-6214.  
 Omaha, 68102, (402) 221-3665.  
 Philadelphia, 19106, (215) 597-2850.  
 Phoenix, 85004, (602) 261-3285.  
 Pittsburgh, 15222, (412) 644-2850.  
 Portland, Ore., 97205, (503) 221-3001.  
 Reno, 89502, (702) 784-5203.  
 Richmond, Va., 23240, (804) 782-2246.  
 St. Louis, 63105, (314) 425-3302.  
 Salt Lake City, 84138, (801) 524-5116.  
 San Francisco, 94102, (415) 556-5860.  
 San Juan, P.R., 00902, (809) 753-4353, Ext. 4555.  
 Savannah, 31402, (912) 232-4321, Ext. 204.  
 Seattle, 98109, (206) 442-5615.

## Country Marketing Managers

Commercial and economic information on most trading partners of the United States is available from the U.S. Department of Commerce.

A Country Marketing Manager is responsible for a country or group of countries as listed below. Assistance or information about marketing in these countries may be obtained by dialing these key people directly: 203-377 plus the given extension.

### Bureau of International Commerce

Area	Extension
<i>Africa</i>	3865
Algeria, Libya, Morocco, Tunisia	5737
Remainder of Africa (except Egypt)	3865
<i>Europe</i>	
France and Benelux Countries	4504
Germany and Austria	5228
Italy, Greece and Turkey	3944
Nordic countries	3848
Spain, Portugal, Switzerland and Yugoslavia	2795
United Kingdom and Canada	4421
<i>Far East</i>	
Australia and New Zealand	3646
East Asia and Pacific	5401
Southeast Asia	2522
<i>Latin America</i>	
Brazil, Argentina, Paraguay and Uruguay	5427
Mexico, Central America, and Panama	2313
Remainder of South America and Caribbean countries	2995
<i>Near East</i>	
Bahrain, Iraq, Jordan, Kuwait, Lebanon, Oman, Peoples Democratic Republic of Yemen, Qatar, Saudi Arabia, Syria, United Arab Emirates, Yemen Arab Republic	5767
Iran, Israel, Egypt	3752

### Bureau of East-West Trade

Eastern Europe	2645
USSR	4655
Peoples Republic of China	3583



PENN STATE UNIVERSITY LIBRARIES



A000070952391